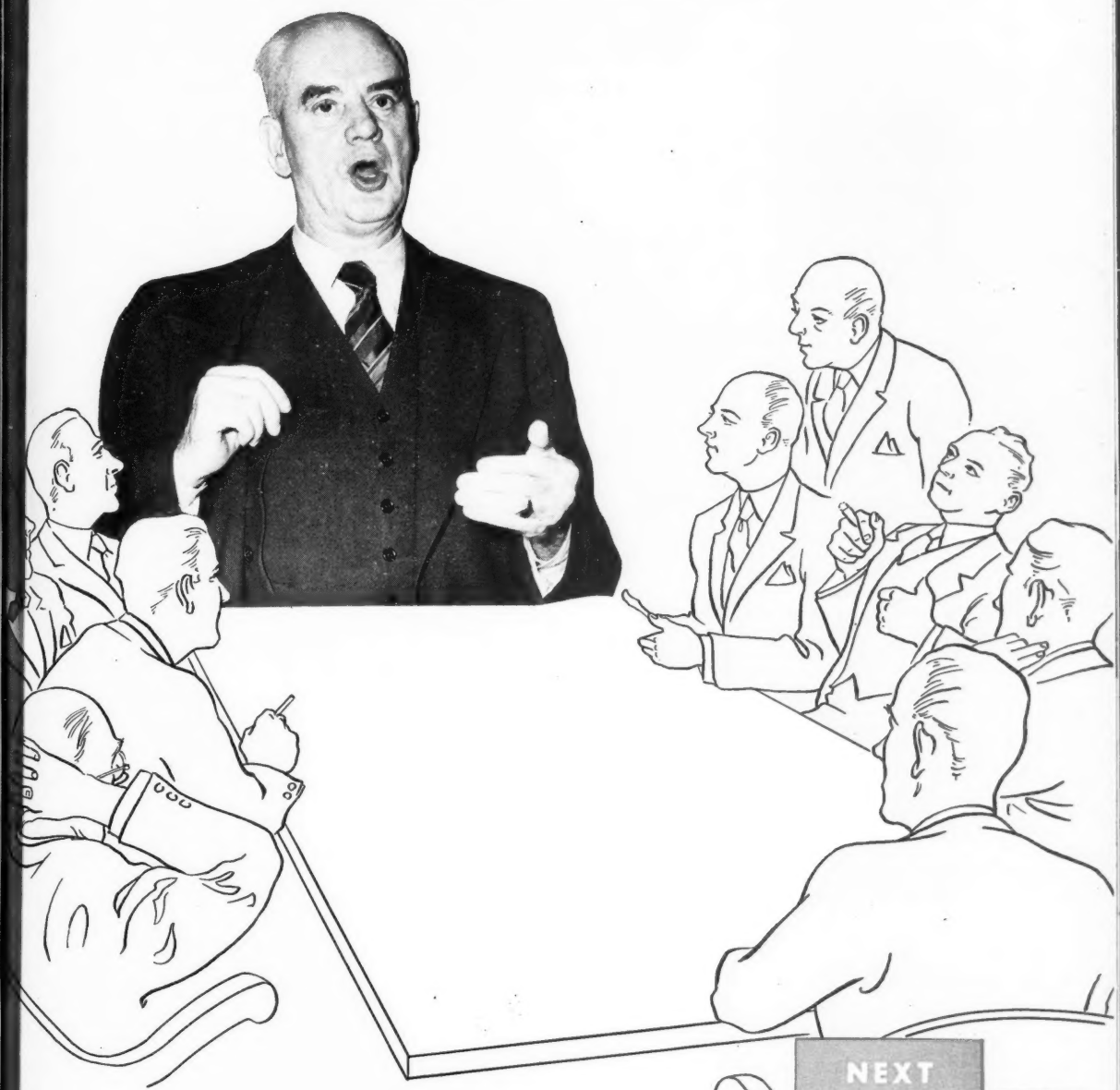
NOVEMBER 12, 1951

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



CRITICAL METALS
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NEXT WAGE ROUND

—see page 47

Trimmed Edges *"Match Exactly"*

AFTER 224 INCH PASS ON QUICKWORK-WHITING STAMPING TRIMMER

70,000 FINISHED UNITS MEET RIGID SPECIFICATIONS

Mr. James A. Leake, The Leake Stamping Company, Monroe, Michigan, says—

"We have used a Model 43HV Quickwork-Whiting Stamping Trimmer machine on the production of U. S. Army Repatriation casket stampings. Briefly, the operations performed are as follows:

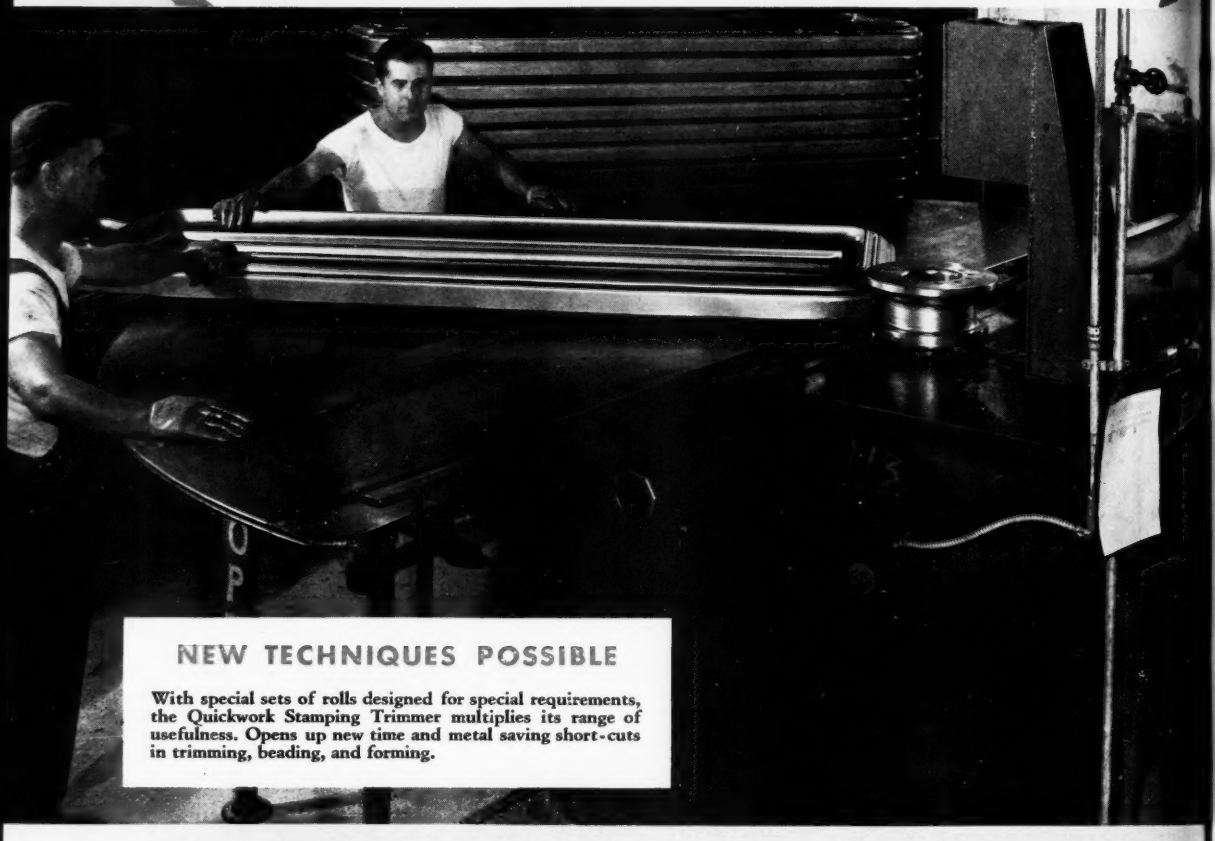
"Base Stamping is made of 18 ga. material measuring approx. 28" x 84" with 6" radius in each corner. The machine to date has produced return flanges on approximately 70,000 pieces with two roll forming operations.

"Top Moulding—Roll Trim. This stamping is made from 20 ga. material and measures approximately 28" x 84" with 6" radius in each corner. It is quite important that the height of this part be maintained to a close tolerance and that the end of the trim match exactly with the beginning of the trim after traveling 224". The machine has trimmed approximately 70,000 pieces to date.

"Absolutely no flaws are permitted on the surface of the stamping. The parts are submitted to close scrutiny of Government inspectors."

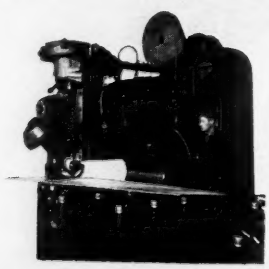
—●—

If you have intricate or complicated stampings to trim, form or bead, it will pay you to write for Bulletin QW-123, today, and learn all about this new idea in metal-working tools.



NEW TECHNIQUES POSSIBLE

With special sets of rolls designed for special requirements, the Quickwork Stamping Trimmer multiplies its range of usefulness. Opens up new time and metal saving short-cuts in trimming, beading, and forming.



Takes the Place of 6 Machines

A Quickwork-Whiting Rotary Shear with attachments does the work of 6 machines. Fast—accurate—tested in service. Models available to handle up to 1" mild steel. Write for Bulletin QW-100R.

QUICKWORK DIVISION

WHITING* CORPORATION

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HARVEY, ILLINOIS

*Reg. U. S. Pat. Off.

Stator Frame for Turbo-Generator Built from BETHLEHEM WELDMENTS

This impressive-looking chunk of steel is a stator frame for a 75,000 kva turbo-generator. It's a big frame, too—weighs over 118,000 lb. The frame has a ¾-in. shell thickness, and is 21 ft, 1 in. long, 12 ft, 5 in. wide, and 12 ft, 10 in. high. It was fabricated from Bethlehem Weldments.

Many builders of large and small machinery and machine parts are profiting today because of the following advantages offered by Bethlehem Weldments:

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FREEDOM OF DESIGN. The steel which goes into a Bethlehem Weldment can be bent, pressed or shaped by other means prior to welding, without any damage to its physical structure.

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We have had long experience in producing weldments. Our facilities include modern bending, forming, flame-cutting and stress-relieving equipment. We'll be pleased to discuss weldments with you at your convenience. Simply contact the nearest Bethlehem office.

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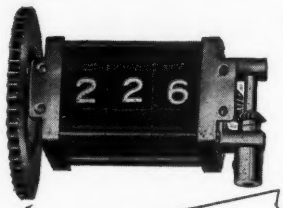

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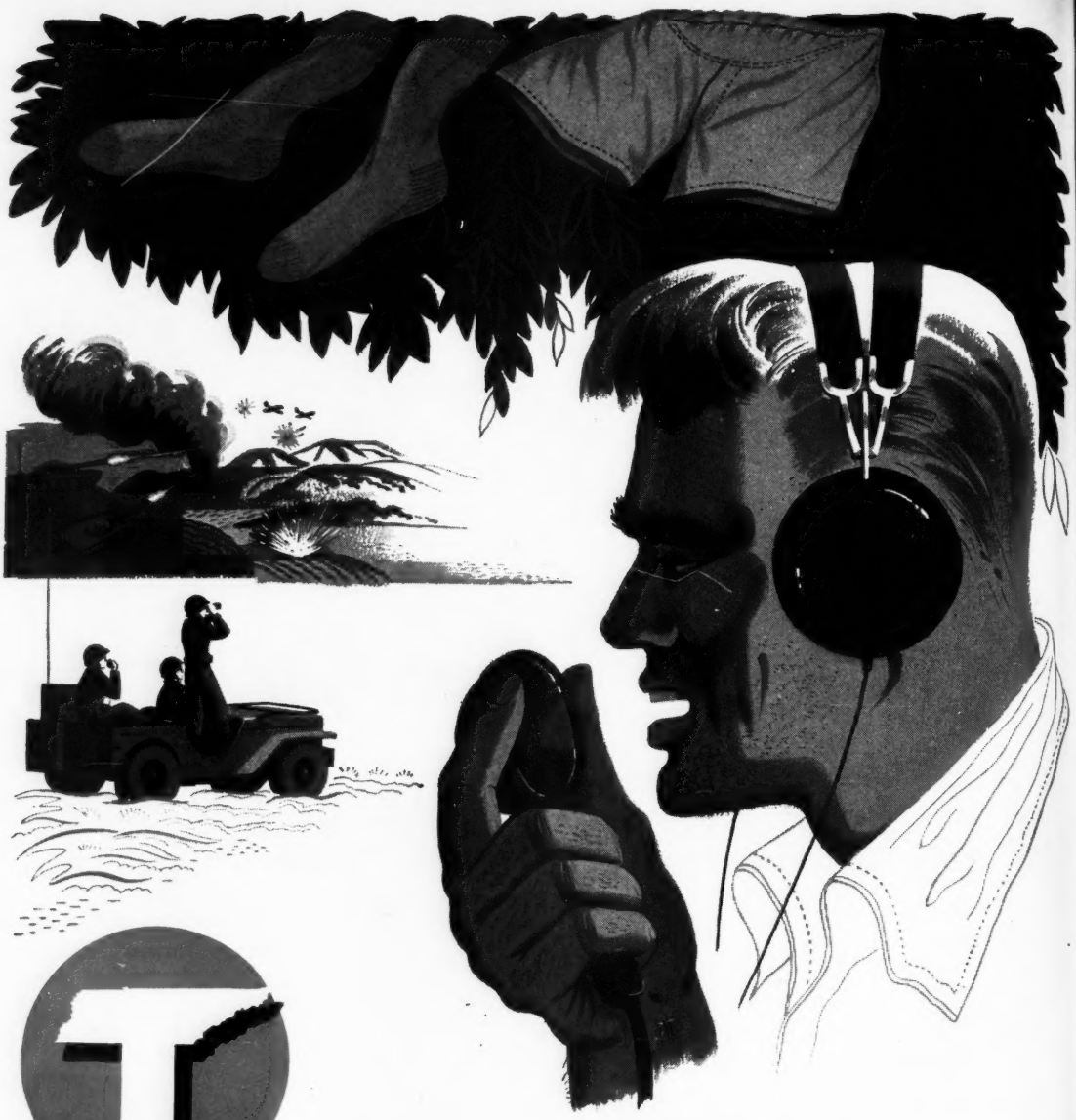

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STEEL

The Weekly Magazine of Metalworking

VOL. 129 NO. 20 NOVEMBER 12, 1951

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Editorial and Business Staff—Page 10. Advertising Index—Page 172. Editorial index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

***Next Week*... Metallography of Titanium Alloys... Revamped Setups Speed Machining of Appliance Parts... Huge Welders Handle Largest Aircraft Fuel Tanks... New Rotary Unit Cools Sinter Economically**

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $20. Single copies (current issues) 50 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879.

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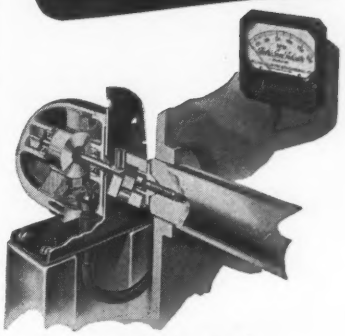

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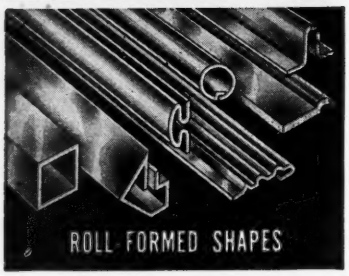

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Behind the Scenes...

Science, It's Wonderful

You'd think there was nothing simpler than picking up a telephone and dialing a number, but James Kilborg Corp., San Mateo, Calif., has simplified even that, according to Allegheny Ludlum Steel Corp.'s handsome *Steel Horizons*.

It has developed a Dialaphone. All you do is press a button and presto—there's the party on the line. The gadget can remember up to 500 telephone numbers and never fails to get the correct one. It's just a little larger than the ordinary telephone and consists of 1030 parts. The top of the machine bristles with pushbuttons—eight for fire, emergency and your six most frequently called numbers. To call anyone of the eight, you lift the receiver, wait for the dial tone and push the key. A rubber finger in the dial arm spins into action and dials the number. While it's working, you can be thinking of some good conversational remarks. In addition to those eight numbers, you can dial 54 more on one model or 506 more on another. That's done by means of a reel of plastic film on the front of the device. You write the names you call most frequently in alphabetical order on the reel, set the apparatus to match name and number. Spin the reel knob to the name you want, press a small bar and your call is automatically dialed.

Aid

Two STEEL reprints have just come off the presses to help you. One reprint puts in booklet form a series of articles written by J. D. Keller, a consulting engineer and partner in Associated Engineers, Pittsburgh, on cold rolling strip. The installments appeared in various issues of STEEL from last February to August, and they make up the latest treatise on the subject. Small quantities are available gratis. Write Steel Plant Editor John D. Knox, STEEL, Penton Bldg., Cleveland 13, O.

The other reprint that had to be rerun was the article written by Associate Editor Vance Bell on how to save money and at the same time stretch your steel supplies. Small quantities are free, from Reader's Service Department, Penton Bldg., Cleveland 13.

Vital Statistics

A piece of scientific research done by the Department of Interior at taxpayer's expense has resulted in a pamphlet called *Deer Mortality from Gunshot Wounds*. One conclusion reached by the detailed study is that more deer without antlers are left lying around after being shot by hunters than are deer with antlers. Wonder why?

Suggested Titles

President Truman wants a library built and dedicated on his behalf at his home town of Grandview, Mo. He suggests that it be named the Truman Memorial Library and that it house all his public papers, letters etc. Rep. Glenn Davis (Rep., Wis.) suggests that these books might be considered by Mr. Truman for inclusion in his library:

Great Grab, by S. Longstreet
How To Avoid Financial Tangles, by K. C. Mastler
Home Freezing for Everyone, by L. J. Alkire
How To Write Letters for All Occasions, by Alexander F. Sheff
Piano Fallacies of Today, by T. A. Matthay
Strategy in Poker, Business and War, by J. D. McDonald
Helping Boys in Trouble, by M. S. Applegate
Handbook of Rigging, by W. E. Rossnagle
Secrets for Sale, by M. V. Hebereden
How Our Government Raises and Spends Money, by M. Newcomer
How To Become President, by G. Allen
How To Get By In Wartime, by E. Campbell.
How To Keep Out of Trouble, by W. S. Weiss
How To Organize a Library, by Z. K. Miller
Pressure Boys, by K. G. Crawford
Mink Farming, by J. L. Edwards
What To Do Until the Psychiatrist Comes, by Norman Anthony
Decline and Fall of Practically Everybody, by W. J. Cuppy

Puzzle Corner

The soldiers in the Nov. 5 quandary could get home the quickest by walking one mile along the highway and then straight across the fields (five miles) to camp. Elapsed time: 87 minutes. First in with that correct answer were Ralph E. Arnold of Ft. Pitt Bridge Works, A. E. Thompson of Midland Co., Paul E. Frantz of Encino, Calif. and Robert Huff of Canton, O.

A three-inch cube, painted black, is sawed into one-inch cubes. How many cubes are painted on three sides, two sides and so on?

Shrdlu

(Metalworking Outlook—Page 39)

Shell Game with a New Twist...

SHARON* HIGH CARBON STRIP STEEL GOES INTO 20 MM. SHELL LINK

THE LINK represents one of those tough little problems of engineering. The part is needed in millions. The tolerances in manufacture are so exacting as to make it a precision production job.

Sharon High Carbon Strip, fed from coils, is being used regularly on this job. For this application a heat treatable spring steel with exceptionally good forming qualities is used. The use of strip aids high speed production. Big Sharon coils reduce down time too.

SHARON STEEL CORPORATION

Sharon, Pennsylvania

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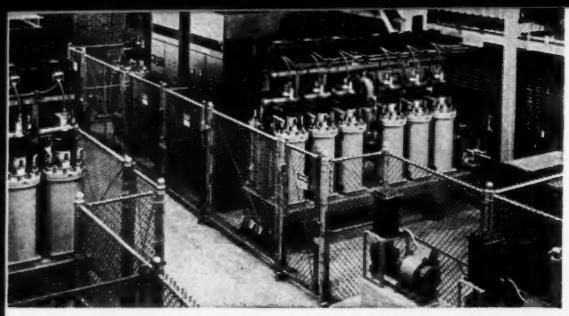
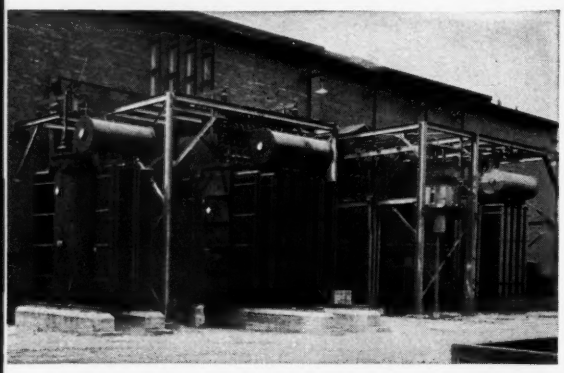
For information on Titanium Developments contact Mallory-Sharon Titanium Corp., Indianapolis 6.

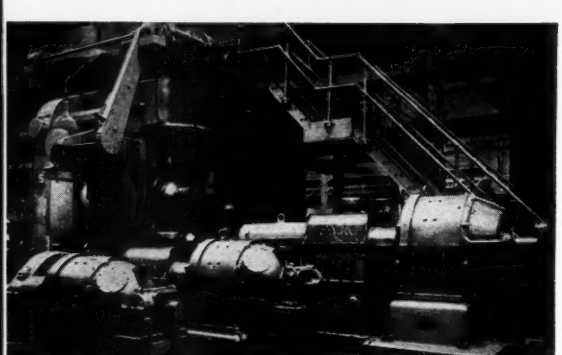
SHARONSTEEL



Interior view of building housing the Allis-Chalmers 16,000 kw mercury arc frequency changer. By-product power—largely generated by Allis-Chalmers steam turbines and gas engines at nearby Gary Steel Works and South Works — is converted from 25 cycles at 23 kv to 1750 volt dc along right side of building. Inverter along left side changes dc to 60 cycles at 6.6 kv linking with the purchased power system.

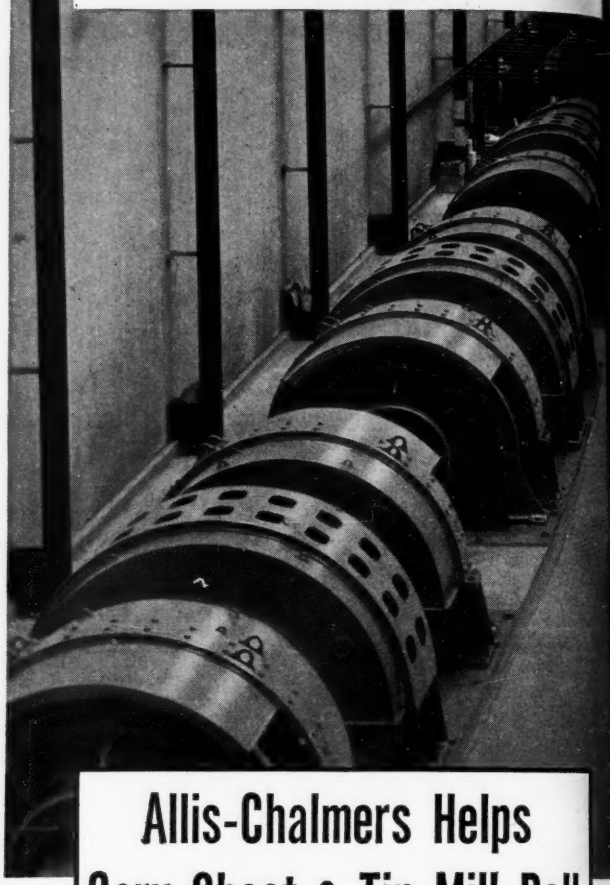


Allis-Chalmers rectifier transformers, reactors and oil circuit breakers serve the 16,000 kw mercury arc frequency changer. Outdoor equipment on the 60 cycle side is seen above. From left to right: dc reactor, 8000 kw self-cooled transformer, 15 kv, 500,000 kva i.c oil circuit breaker, and 8000 kw self-cooled transformer.



Seen here is a veteran two stand temper pass mill still going strong after 15 years on the job. Allis-Chalmers dc motor drives, supporting synchronous M-G sets, switchgear, and control are employed on one single stand and four two stand tandem temper pass mills doing all the tinplate temper rolling.

15 Year Old Hot Strip Mill



Allis-Chalmers Helps Gary Sheet & Tin Mill Roll 2,377,274 Tons a Year

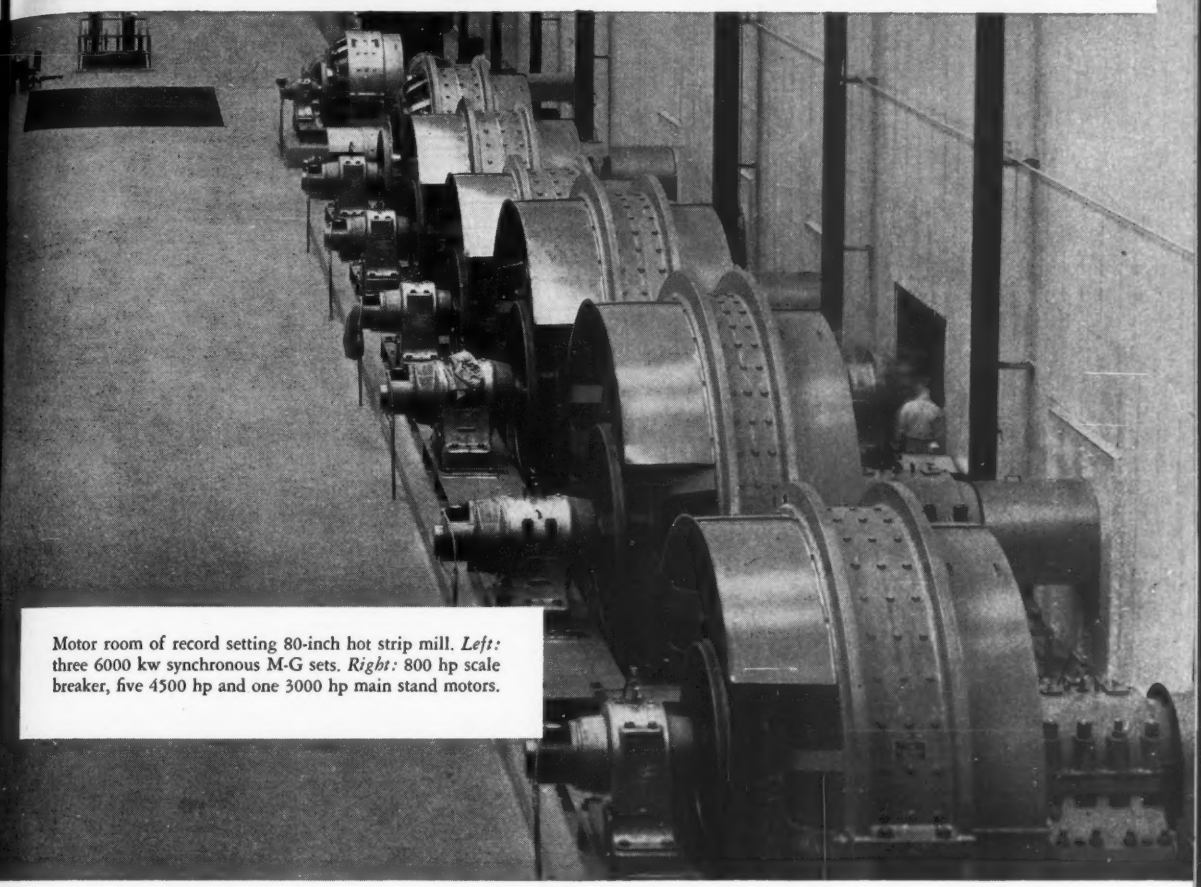
AFTER 15 YEARS IN OPERATION, this 80-inch hot strip mill in 1950 rang up a new annual tonnage world record of 2,377,274 tons! Top 8-hour turn was 4,147 tons. Top month was 222,751 tons. Equipment durability cannot be better demonstrated.

Located at the Gary Sheet and Tin Mill of the United States Steel Company, the mill rolls tough stainless steel as well as strip for regular sheet and tinplate products. Allis-Chalmers supplied the complete electrical equipment driv-

Power, Electrical, Processing Equipment for Iron and Steel

ALLIS

SETS WORLD TONNAGE RECORD!



Motor room of record setting 80-inch hot strip mill. *Left:* three 6000 kw synchronous M-G sets. *Right:* 800 hp scale breaker, five 4500 hp and one 3000 hp main stand motors.

ing, supporting and controlling this veteran hot strip mill.

Originally installed in 1936, it has since been revamped to meet current demand. But the electrical equipment is still Allis-Chalmers with the original motors, generators and switchgear remaining in operation despite 15 years of punishing shock loads and sustained peak loads!

Allis-Chalmers quality equipment also is displaying durability elsewhere in the Gary Sheet and Tin Mill operation. Five Allis-Chalmers equipped temper mills (lower left) have been in daily operation for 15 years.

First Mercury Pool Frequency Changer

With equipment quality so thoroughly proved, the Gary Sheet and Tin Mill selected Allis-Chalmers to build the first commercial mercury pool type frequency changer in America (upper left). Now in its eighth year, it interchanges power between the 25 cycle system and the 60 cycle purchased power system.

The 16,000 kw electronic frequency changer greatly increases flexibility and economy of operation by permitting full utilization of by-product power and reducing purchased power demand peaks. Other Allis-Chalmers mercury arc rectifiers also are used here to provide 250 volt dc mill supply.

Whatever your needs in electrical equipment for iron and steel production, A-C will supply you with dependable, quality equipment. For specific information on a *complete* range of generation, switching, conversion, rectification, drive, and control equipment . . . call your nearest A-C office or write to Allis-Chalmers, Milwaukee 1, Wis. A-3505

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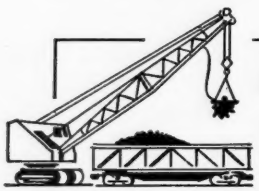

MARKET YOUR SCRAP!

Now is the time to houseclean your plant for all worn out and obsolete equipment. Iron and steel scrap, the vital ingredient in steel making, is in critically short supply.

In order to keep America's steel industry producing at the highest rate in history . . . the "forgotten" or neglected scrap in your plant is urgently needed. You can help yourself and your country by selling your scrap to your dealer NOW.

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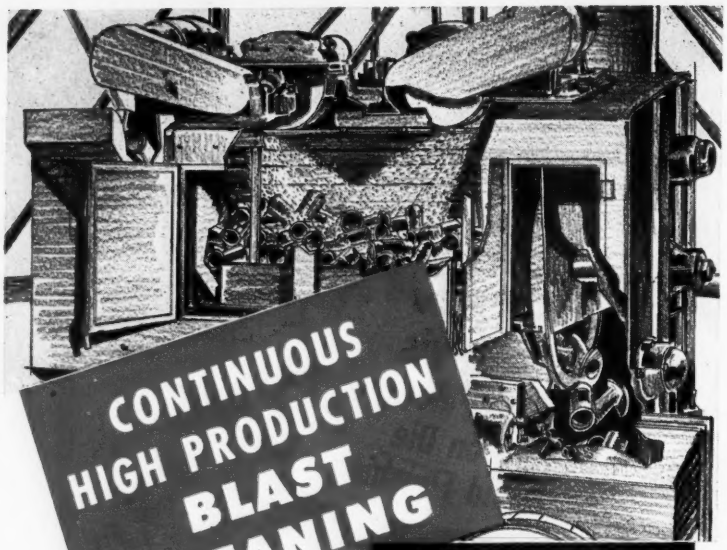


CONTINUOUS HIGH PRODUCTION BLAST CLEANING

without stoppages for loading or unloading

The Continuous Wheelabrator® Tumblast

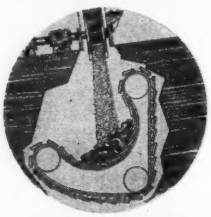
LOADS AND UNLOADS AUTOMATICALLY

It is no longer necessary to waste hours each day in starting, stopping, loading and unloading operations. The Continuous Wheelabrator Tumblast turns these waste motions into productive time as it is loaded and unloaded automatically.

Conveyor Loading

CLEANS AT HIGH RATE OF SPEED

Work progresses continuously through the machine, passing within the crossing abrasive blasts of two Wheelabrator units. The result is a fast, uniform removal of all sand and scale. Production up to 39 tons an hour has been attained in a large automotive foundry.

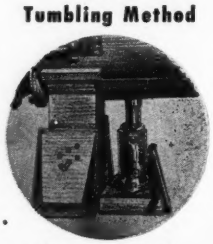


Tumbling Method

PRODUCES AN ENDLESS FLOW OF CLEANED PARTS

The Continuous Tumblast maintains a steady, uniform flow of work through the cleaning department and thus lends itself to "in-line" production. It can be adjusted for speed to meet any desired standard of cleaning quality.

Built in five standard sizes. Write for details.



Adjusting Angle

Wheelabrator® AIRLESS BLAST CLEANING

American WHEELABRATOR & EQUIPMENT CORP.

509 S. Byrkit St., Mishawaka 5, Ind.

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST CLEANING EQUIPMENT

LETTERS TO THE EDITORS

Metal—Who Needs It?

The article, "Who Has the World's Metals" (STEEL, Oct. 8, p. 120), is one of the most interesting and valuable that I have read in a long time and I would like to obtain a few tear sheets to be submitted to the key men in our organization for their permanent file. The article was certainly timely, too.

William M. Cowles
Vice President in Charge of Sales
Superior Steel Corp.
Carnegie, Pa.

I am a member of the faculty of the Industrial College of the Armed Forces. The Industrial College specializes in training senior Army, Naval, and Air Force officers in problems concerned with mobilizing the nation's industrial economy. In my special field, I travel all over the United States lecturing to senior Army, Naval, and Air Force officers and executives of industry, education, and civil government.

It is requested that you grant the Industrial College the privilege of reproducing several of the charts that appear in the Oct. 8 issue of STEEL ("Who Has the World's Metals"). I congratulate you on the thoroughness of the article in question and I am hopeful that such articles will continue to appear regularly.

Walter R. Godard
Colonel, USAF
The Industrial College of the Armed Forces
Washington, D. C.

• *You certainly may use the charts.*

A Standard Question

I read with great interest your article "Standardization—Key to More for Less" (STEEL, Sept. 24, p. 94). Are you able to supply further information? I would also like to know more about the American Standards Association.

B. S. Maguire
Niagara Blower Co.
Buffalo, N. Y.

. . . . I would appreciate any further information . . . . also the location of nearest American Standards Association branch.

Athel F. Denham
Denham & Co.
Detroit, Mich.

• *Address of the American Standards Association Inc. is 70 East 45th St., New York 17, N. Y. We suggest that you contact this organization for more information on standardization.*

Help Wanted

We would appreciate a tear-sheet of your article "Scaled Down?" (STEEL, Oct. 15, p. 50).

W. F. Garlow, sales promotion manager
Howe Scale Co.
Rutland, Vt.

Please send us a reprint of the article entitled "High Speed Quenching Oils Increase Surface Hardness" by W. J. Reitze (STEEL, June 18, p. 72).

E. A. Hill, product engineer
Palnut Co.
Irvington, N. J.

• *These reprints and tear-sheets have been forwarded.*

This 85" hollow-section ring is produced by The French Oil Mill Machinery Company, Piqua, Ohio. It weighs 6500 lbs. and meets tensile strength requirements of 40,000 lbs.

Consider, for example, this giant ring—a component of the desolventizer toaster used in processing soya beans into cattle feed. Hollow passages between the ¾" thick dual wall sections form a pressurized steam chamber. Because of this, each finished casting must undergo a 300 psi water pressure test before passing code inspection.

Here are the reasons why CHATEAUGAY, Republic's *exclusive* premium pig iron, is used in this application:

1. **CHATEAUGAY is an exceptionally fluid iron . . . cools evenly . . . fills adjoining light and heavy sections completely.**
2. **CHATEAUGAY shrinks evenly throughout every casting . . . produces an unusually fine and uniform grain structure.**
3. **CHATEAUGAY castings machine readily.**

Whether or not you use CHATEAUGAY Pig Iron, a Republic Pig Iron Metallurgist will be glad to help you get top production from your present facilities. Just let us know when you would like to see him.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, New York

Republic PIG IRON

"CHATEAUGAY"	"REPUBLIC"	"PIONEER"
Low-Phosphorus, Copper-Free	(Northern) Foundry, Basic and Malleable	(Southern) Foundry and Basic

REPUBLIC STEEL

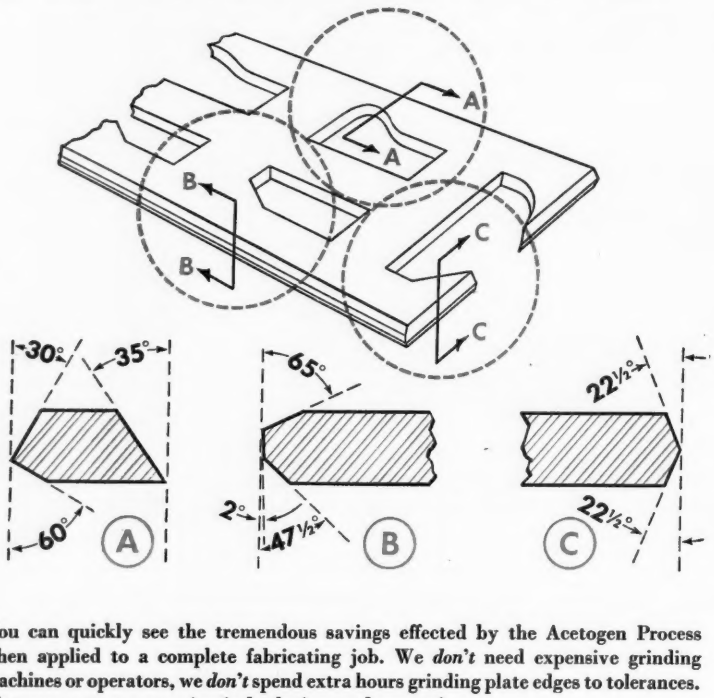
You asked for it . . . now Acetogen brings you

A Complete— STEEL FABRICATION SERVICE

— the only one of its kind

You undoubtedly have heard or read about the amazing Acetogen Process—the new way of flame-cutting armor plate and other steel to ±1/16 inch tolerance. *Now,* Acetogen offers you a *complete* steel fabrication service which employs this advanced flame-cutting method. You can have the toughest of fabricating jobs done for you *better, cheaper and faster!* Here's why:

The Acetogen Process of plate-edge preparation is so accurate, we can *flame-cut* steel to very close tolerances. *No longer is it necessary to grind an intricate bevel or radius.* Look at this example . . . a drawing of a finished plate which others must *grind* to required tolerances, but which we *flame-cut* to the same tolerances!



You can quickly see the tremendous savings effected by the Acetogen Process when applied to a complete fabricating job. We *don't* need expensive grinding machines or operators, we *don't* spend extra hours grinding plate edges to tolerances. We pass on *to you* a saving in both time and money!

And there are other advantages. Plate edges prepared by the Acetogen Process have a sufficiently low Brinell hardness to allow machining. Plates are ready for welding without *any* further preparation. Above all, *they are precise!*

A New, Fully-Equipped Plant

The modern Acetogen plant contains all the machine tools necessary to do a complete fabricating job (welding, forming, and sub-assembling) on armor plate, low-carbon and high-alloy steels, as well as on all other types of metals. It is operated by men thoroughly experienced in the working of these metals for both ordnance and aircraft applications.

Send us your drawings, sketches, or blueprints *now* for any fabricated work you have, and we will promptly quote price- and time-schedules. Our organization has full security clearance to contract for defense work through the Department of the Army, Philadelphia Ordnance Division. Let Acetogen take your fabricating problems off your hands! *Write today!* Acetogen Fabricators, Inc., Room 822, Commercial Trust Building, Philadelphia 2, Pa.

Originators of precision flame-cutting

ACETOGEN FABRICATORS, INC.

NOW... GISHOLT VERTICAL BALANCING MACHINES

STILL FASTER PRODUCTION BALANCING FOR PARTS UP TO 50 LBS.!

Gisholt leadership in balancing is demonstrated again.

Designed for high volume balancing, these new models locate and measure unbalance with a speed and accuracy unequaled by any other means. Unbalance vibrations as small as .000025" are clearly indicated.

Here's everything for sustained high speed production: compact design . . . meter and angle dial at eye level . . . spindle close to operator for speedy handling of parts . . . all controls efficiently grouped for short reach, less movement, minimum operator fatigue. Machine may be furnished with raised bed for operator to work in standing position.

Using the same proved principle as other Gisholt Balancing Machines, Gisholt Vertical Balancers are available for both static and dynamic balancing of parts up to 50 lbs. Correction equipment can be added where desired. Write for full information.

The Model 1SV1 Vertical Balancing Machine illustrated is one of four basic models of this new type.

DYNETRIC BALANCERS — GISHOLT — DEVELOPED JOINTLY WITH WESTINGHOUSE ELECTRIC CORPORATION "DYNETRIC" IS A TRADE MARK REG. U. S. PAT. OFFICE BY WESTINGHOUSE ELECTRIC CORPORATION

✱ **GISHOLT BALANCING SCHOOL.** *Complete courses are now offered, covering the theory and practical applications of balancing to help you with your problems. Ask for details.*

THE GISHOLT ROUND TABLE
represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

Grinding Problem?

Black & Decker Bench and Portable Grinders speed up a wide range of jobs!

B&D Bench Grinders sharpen cold chisels, wood chisels, twist drills, many other tools; handle many types of grinding and metal removal; remove rust, clean dirty, gummy parts, prepare surfaces for painting, buff and polish plated metal surfaces. Four models: 6″, 8″, 10″ wheel diameter, ¼ to 1 H.P.

B&D Portable Grinders let you bring the tool to the work when work is heavy, bulky, hard to move. Prepare surfaces for welding; smooth welds; snag and grind castings; remove rust, scale, old paint; cut off old rivets, bolts, studs; grind, clean and buff frames, cabinets, etc. 5″ and 6″ wheel diam.

Quality-built models to suit your needs, give long service!

BLACK & DECKER Grinders do *more* jobs because of their surprising versatility and "tailored-power" B&D motors—do them *better* because of their real quality construction! B&D Bench Grinders give you dependable, B&D-built constant-speed motors; streamlined design for more work clearance; adjustable U-shaped tool rests for better support; strong steel wheel guards for extra safety. B&D Portable Grinders give you perfect balance for easier handling; splined gear mountings for perfect power transmission; steel bearing inserts for smooth running; complete abrasive dust protection for vital parts; extra-safe welded steel wheel guards.

Whatever your problem, see your nearby B&D Distributor *first* for expert help—and for eye-opening demonstrations of timesaving, cost-cutting B&D Tools! Write for free catalog to: THE BLACK & DECKER MFG. CO., 620 Pennsylvania Ave., Towson 4, Maryland.

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B&D Black & Decker

PORTABLE ELECTRIC TOOLS

FREE!

SEND FOR THIS VALUABLE HANDBOOK

"Machining Aluminum Alloys"

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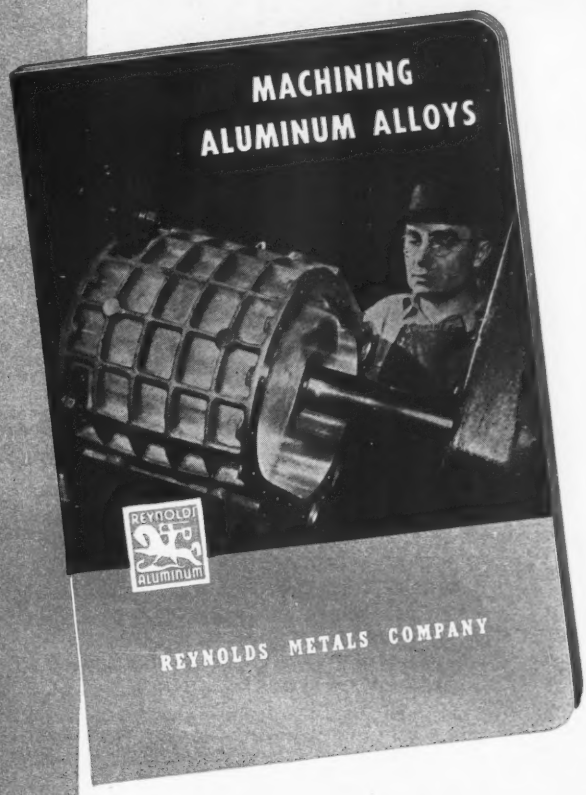
All you need
to know about machining
aluminum



One in a Series of Aluminum Design and Fabricating Books*

Here is a 132 page illustrated reference book covering every phase of aluminum machining. "Machining Aluminum Alloys" includes illustrated charts which give recommendations for tooling, proper cutting speeds and feeds; also specifications for coolants, lubricants and cutting compounds . . . a *complete* handbook.

With proper techniques and tooling methods described in the book, aluminum machining rates are usually limited only by the maximum capacity of your machine tools.

For special problems take advantage of Reynolds trained staff of aluminum specialists. They have the show-how to help you overcome difficulties and get set for fast, economical production. For prompt service, call the Reynolds office or your distributor listed under "Aluminum" in your classified telephone directory.

*** SEND FOR THIS VALUABLE HANDBOOK TODAY!**

Get your free copy of "Machining Aluminum Alloys" and a complete index of Reynolds technical literature. Request on business letterhead (otherwise price is $1.00). Write today to Reynolds Metals Company, 2510 South Third Street, Louisville 1, Kentucky.

Be sure to see the Kate Smith Family Hour, NBC-TV, 8 P.M., E.S.T. Wednesdays
***Hear* The Big Show with Tallulah Bankhead, NBC Radio Network, 5 P.M., E.S.T. Sundays**

REYNOLDS METALS

REYNOLDS ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND

HERE COMES HELP!

from your nearby Reynolds Aluminum distributor

Reynolds is putting forth every effort to ease your aluminum-buying problems. To meet the growing demand Reynolds Metals Company and other U. S. producers have already started on another vast expansion program which will greatly increase the country's aluminum production capacity.

To meet your immediate problems the nearby Reynolds distributor listed below is doing his level best to fill orders from limited stocks.

You can also count on his assistance and guidance in selecting temporary alternate materials. He will apply all of his experience and energy to helping you out. Present your procurement problems to him. Now as always he will give you the kind of service you need and want.

Be sure to see the Kate Smith Family Hour, NBC-TV, 8 P.M., E.S.T. Wednesdays
***Hear* The Big Show with Tallulah Bankhead, NBC Radio Network, 5 P.M., E.S.T. Sundays**

YOUR REYNOLDS DISTRIBUTOR IS LISTED BELOW

ALABAMA
Arnold-Brown Metals & Supply Co., Birmingham
Southern States Iron Roofing Co., Birmingham

CALIFORNIA
Clingan & Fortier, Inc., Los Angeles and San Francisco
Richard G. Stern & Co., Los Angeles
Tay-Holbrook, Inc., San Francisco
Union Hardware & Metal Co., Los Angeles
United States Steel Supply Co., Los Angeles and San Francisco
Western Metal Supply Company, San Diego

COLORADO
Marsh Steel Corporation, Colorado Springs and Denver

CONNECTICUT
American Steel & Alloys Corp., Hartford

FLORIDA
Horne-Wilson, Inc., Jacksonville, Miami, Orlando and Tampa
Southern States Iron Roofing Co., Jacksonville and Orlando

GEORGIA
Southern States Iron Roofing Co., Albany, Atlanta and Savannah

ILLINOIS
J. G. Braun Co., (Architectural only) Chicago
Silverstein & Pinsof Inc., (Ingots only) Chicago
United States Steel Supply Co., Chicago
Benjamin Wolff & Co., Chicago

INDIANA
Hubbell Metals, Inc., Indianapolis

KENTUCKY
Southern States Iron Roofing Co., Louisville

LOUISIANA
Southern States Iron Roofing Co., New Orleans

MARYLAND
Clendenin Bros., Inc., (Wire, rod, bar, structurals) Baltimore
Lyon, Conklin & Co., Inc., Baltimore
United States Steel Supply Co., Baltimore

MASSACHUSETTS
Bay State Refining Co., (Ingots only) Chicopee Falls
Arthur C. Harvey Company, Boston
Pratt & Inman, (Wire, rod, bar, structurals) Worcester

MICHIGAN
Kasle Steel Corporation, Detroit
McDonnell Bros., (Architectural only) Detroit
Milton A. Meier Co., (Ingots only) Detroit

MINNESOTA
United States Steel Supply Co., St. Paul
Vincent Brass & Copper Co., Minneapolis (Wire, rod, bar only)

MISSISSIPPI
Southern States Iron Roofing Co., Hattiesburg

MISSOURI
Hubbell Metals, Inc., Kansas City and St. Paul
Marsh Steel Corporation, N. Kansas City

NEW JERSEY
Edgcomb Steel Corporation, Hillside

NEW YORK
J. G. Braun Co., (Architectural only) New York
Edgcomb Steel Corporation, Hillside, N. J.
Rochester Smelting & Refining Co., (Ingots only) Rochester

NORTH CAROLINA
Southern States Iron Roofing Co., Raleigh

OHIO
The Atlas Metal Co., (Ingots only) Cleveland
The Hamilton Steel Co., Cleveland
Mutual Manufacturing & Supply Co., Cincinnati

OREGON
Woodbury & Company, Portland

PENNSYLVANIA
Athos Steel Service Co., Philadelphia
Colonial Smelting & Refining Co., (Ingots only) Columbia
Levinson Steel Sales Company, Pittsburgh
Merchant & Evans Co., Philadelphia
Potts-Farrington Company, Philadelphia

SOUTH CAROLINA
Southern States Iron Roofing Co., Columbia

TENNESSEE
Southern States Iron Roofing Co., Nashville and Memphis

TEXAS
Moncrief-Lenoir Mfg. Co., Dallas, Ft. Worth, Harlingen, Houston, Lubbock, San Antonio, and Temple

UTAH
Salt Lake Hardware Co., Salt Lake City

VIRGINIA
Southern States Iron Roofing Co., Richmond

WASHINGTON
Seattle Steel Company, Seattle

WISCONSIN
United States Steel Supply Co., Milwaukee
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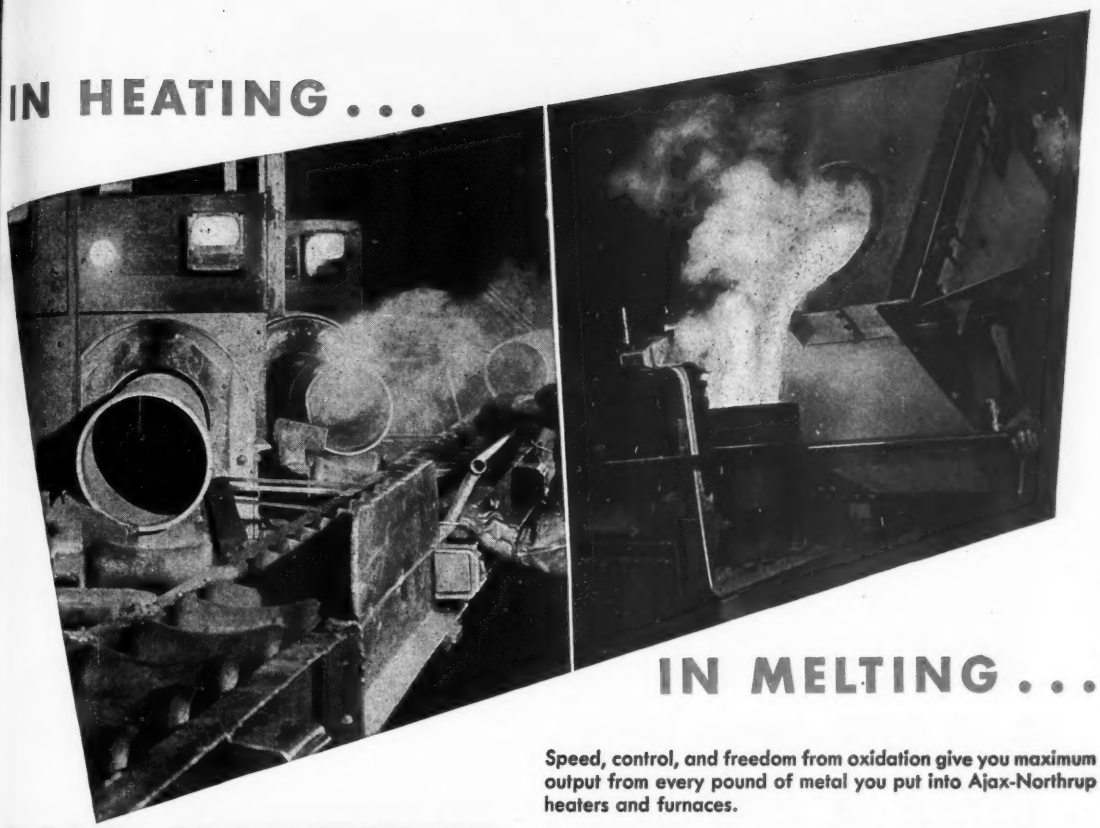
LOOK UNDER "ALUMINUM" IN YOUR CLASSIFIED TELEPHONE DIRECTORY

REYNOLDS METALS

REYNOLDS ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND

IN HEATING . . .



IN MELTING . . .

AJAX-NORTHRUP Saves Metals

Speed, control, and freedom from oxidation give you maximum output from every pound of metal you put into Ajax-Northrup heaters and furnaces.

Induction melting furnaces melt so fast there's no time for oxidation—losses of critical elements are held to a minimum. One user, melting stainless steel, reports recovery of 100% of the nickel charged, 99.0% of the chromium, 90% manganese, and 92% columbium. Another saved $60,000 a year just by reducing chromium losses!

Forging heaters are equally thrifty. One automobile manufacturer reports ten tons of steel saved a day—enough for 3800 additional forgings. Savings up to 20% are commonplace, because fast, automatically timed induction heat eliminates steel-wasting scale and permits the use of smaller billets.

Ajax-Northrup melting furnaces are available in sizes from eight ounces to 8 tons, to melt *any* metal. Heaters for forging and other uses can be engineered to suit practically any of your high-speed production line jobs. Put our 35 years of experience with induction to work for you—write us today!

SEND FOR NEW INDUCTION HEATING AND MELTING BULLETIN.

AJAX ELECTROTHERMIC CORPORATION

AJAX PARK • TRENTON 5, NEW JERSEY

AJAX NORTHRUP

HEATING AND MELTING

Associate Companies

AJAX ELECTRO METALLURGICAL CORP. • AJAX ELECTRIC COMPANY, INC.
AJAX ELECTRIC FURNACE CORPORATION • AJAX ENGINEERING CORPORATION

we never use crystal gazers.....

in the making of

WICKWIRE WIRE.....

Crystal gazers have no place in the making of Wickwire Wire. Our engineers and metallurgists work with the specialized know-how of long experience... maintain constant and careful control over every phase of production starting with the analysis and composition of iron in our blast furnaces and steel in our open hearth furnaces.

Rigid testing, checking and inspection — every step of the way — are your assurance that when you specify Wickwire Wire you can always count on unvarying uniformity of quality, size, tensile strength and stiffness.

We would welcome an opportunity to apply our skill and experience to the solving of any wire problem you may have. High or low carbon steel; round or shaped; in all tempers, finishes and grades — FOR THE WIRE YOU REQUIRE... CHECK FIRST WITH WICKWIRE.

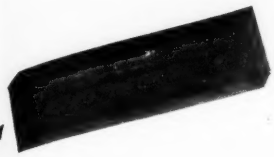
For additional information write or phone our nearest sales office.

THE COLORADO FUEL & IRON CORPORATION — Denver, Colorado
THE CALIFORNIA WIRE CLOTH CORPORATION — Oakland, California
WICKWIRE SPENCER STEEL DIVISION — Atlanta • Boston • Buffalo
Chicago • Detroit • New York • Philadelphia

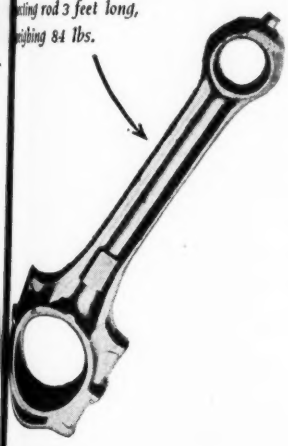
WICKWIRE WIRE

CF&I PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL & IRON CORPORATION

Hammered for maximum Strength and Toughness



This is the billet of steel 4-3/4" x 4-3/4" x 18-1/2" which is forged into this diesel connecting rod 3 feet long, weighing 84 lbs.



What a forging this diesel connecting rod is! Three feet in length (the average automobile engine's connecting rod is less than a foot long) weighing 84 pounds (against 4 pounds for the automobile connecting rod) it starts as a hot billet of steel 4-3/4 inches square by 18-1/2 inches long, which is hammered between two dies for seven different operations to form the completed forging shown.

Such a diesel connecting rod must stand terrific stresses and strains. It transmits the power from the explosion in the cylinder by way of the piston and piston pin to the crankshaft to the flywheel and thence to whatever the engine is driving.

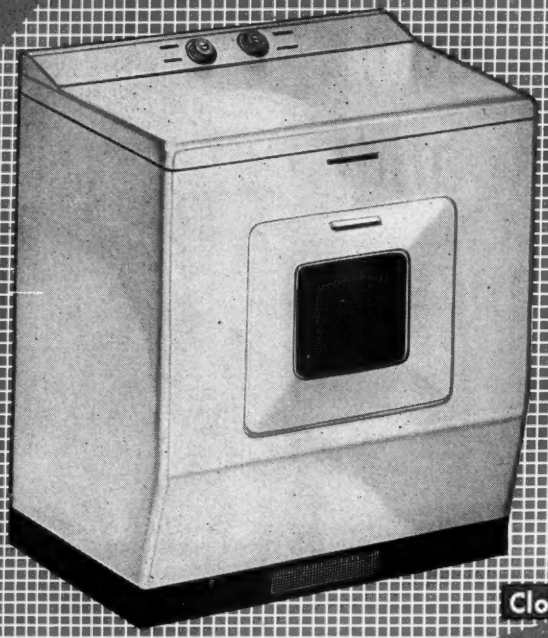
Thousands of hammer forged connecting rods are working for you every day.

AMBERSBURG ENGINEERING CO. ·· CHAMBERSBURG, PA.

CHAMBERSBURG

THE HAMMER BUILDERS

clothes dryers to deep fryers



wire cloth

FOR HOME APPLIANCES

Whether the wire cloth is to be "standard" . . . or "strictly to specifications" . . . or a tough "start from scratch" new development problem—Reynolds engineers are right at home in the home appliance field. And in other fields—automobiles to aircraft . . . farm harvesters to fly swatters . . . floor furnaces to faucet filters. And for the same reasons—Reynolds' fifty years of fabricating wire, and many, many more years of research measured in engineering man-hours. If you use wire cloth, Reynolds engineers can be helpful. Consult them without cost or obligation.

- Clothes Dryers
- Automatic Washers
- Dishwashers
- Refrigerators
- Home Freezers
- Vacuum Cleaners
- Electric Ventilators
- Dehumidifiers
- Fruit Juicers
- Electric Deep Fryers

REYNOLDS WIRE DIVISION
NATIONAL-STANDARD COMPANY

DIXON, ILLINOIS

NS NATIONAL-STANDARD Company NILES, MICHIGAN

You Can't Ship Acid in Paper Bags!

RETURN EMPTY ACID DRUMS, CARBOYS AND CASES—NOW!

AS THE DEMANDS FOR ACIDS INCREASE, the supply of shipping containers grows smaller by the day.

YOU CAN HELP keep more acid flowing to you and other users by returning containers as soon as possible. So empty your drums, carboys and cases without delay . . . then return them promptly to the shipping locations.

YOU'LL SAVE TWO WAYS: your money won't be tied up in deposit charges; you won't *lose* deposits because of containers lost or damaged during long storage.

Most of all, you'll be helping General Chemical to maintain the prompt, efficient service Industry must have to meet today's demands.

GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
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The Heat's On!

● ● ● ● And from heats such as this will come high alloy, high quality steel to implement our ever increasing defense needs . . . our constantly growing demand for specialized steels to make possible the production of most everything we use in our daily lives.

Helping America's electric arc furnaces meet modern metallurgical requirements . . . to operate efficiently and economically under tough conditions . . . calls for the ultimate in refractories. General Refractories is an important factor in meeting this challenge.

In electric furnaces such as this you'll find sidewalls, bottoms and tapping

spouts of
roofs of G
alumina.
are speci
operating
Whene
new refra
the world

GENERAL REFRACTORIES

GENERAL REFRACTORIES COMPANY
PHILADELPHIA

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spouts of General's basic materials . . . roofs of General's silica, fireclay or high alumina. General Refractories products are specifically designed to meet all operating conditions.

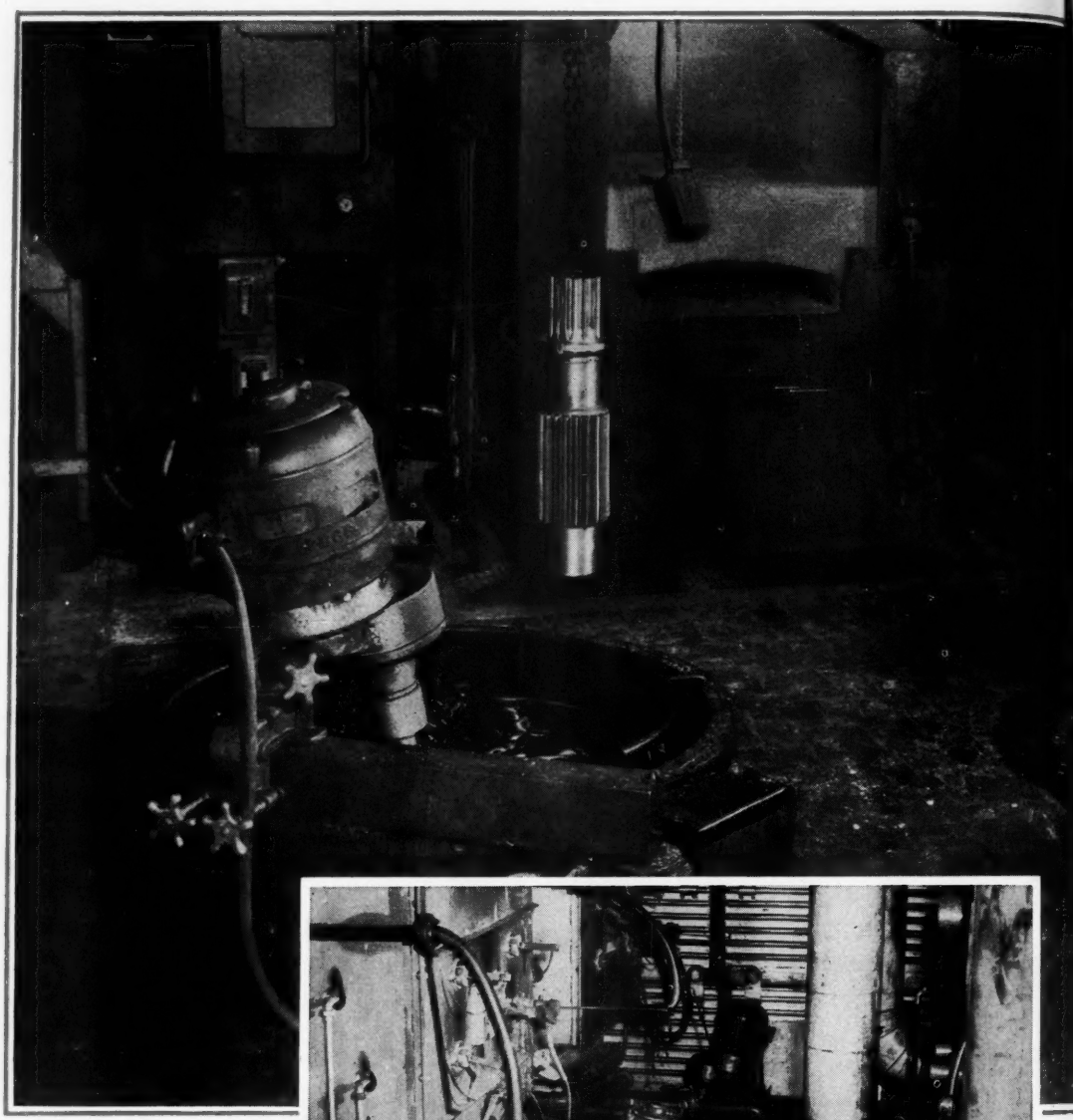
Whenever the steel industry faces a new refractories problem, General offers the world's most modern research facilities to find the solution. And General offers the productive capacity of 43 mines and 29 plants, here and abroad . . . 18 sales offices . . . 200 distributing agencies. Put your problem, concerning application or supply, up to General Refractories—the company that offers a complete refractories service.

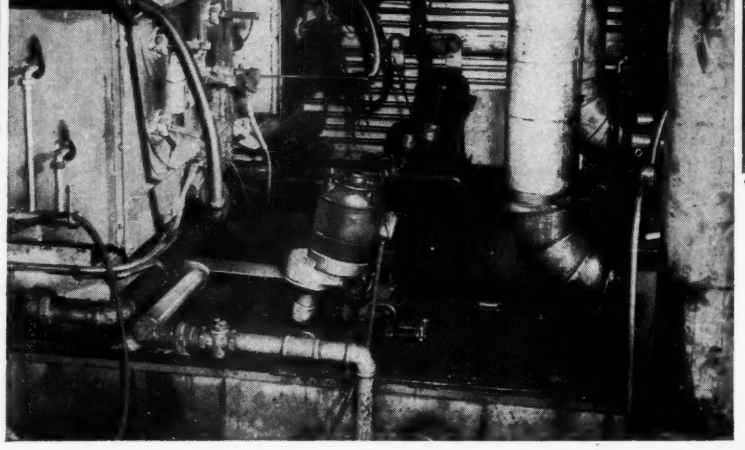
A Complete Refractories Service

●

HOW TO GET THE MOST OUT OF

Double-check you

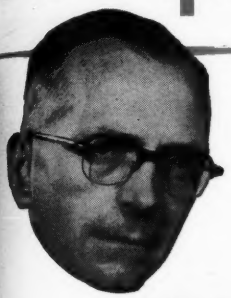




U-S-S Improved Heat Treatment is an improved method of quenching and tempering by means of violent agitation of the quenching bath. The basic engineering principles include quench tank design, and the definite size, number, placement and powering of the propellers.

THE ALLOY STEEL YOU'RE GETTING

...your quenching methods



Here's how Jeffrey Manufacturing Company makes use of

U·S·S Improved Heat Treatment

—as told by Mr. C. S. Thomas, Chief Metallurgist

"We use U·S·S Improved Heat Treatment for batch hardening large parts, and continuously hardening small parts.

"We formerly had trouble with excessive and variable quench water temperature; this in turn caused uneven hardening. But now the U·S·S agitated quench process gives us uniform hardening almost without exception.

"It is now much easier to quench large parts, such as 100 pound alloy steel gears, because the man does not have to move the part. Instead, it hangs motionless in the quench while the agitated oil extracts heat rapidly and uniformly. The direct results are: increased production (less time needed for quenching), less chance for human error and more satisfactory hardening.

"Like many metallurgists, as soon as we have hardening trouble we look for trouble in the quench. U·S·S Improved Heat Treatment is providing an economical and efficient method of improving our quenching practice."

● Most of you who use alloy steel have one problem in common today; you must continue to turn out products of the same quality your customer is accustomed to, while using steels containing a smaller percentage of many of the important alloying elements.

To do this, many of you must look to new methods of developing the ultimate in mechanical properties in the leaner alloy steels. One of the best ways to get those maximum properties from leaner alloy steels is to make use of the best available heat treating practices. Utmost care must be given to *all* phases of heat treatment; heating, *quenching*, and tempering—keeping in mind the "H" value of *your* water or oil quench tank, and the hardenability of the steel you are using.

United States Steel Company has developed an improved agitated quenching method to give you better results with leaner alloy steels—or with most all steels for that matter. We call it U·S·S Improved Heat Treatment. The actual process includes quench tank design plus the definite size, number, placement and powering of the propellers that agitate the bath. This quenching method extracts the heat evenly and rapidly from the entire surface of the part.

Close to a hundred manufacturers are already using this improved quenching method, and without exception report better heat treating results. They cite the following advantages over methods which provide for no agitation or inadequate agitation of the quenching medium:

1. **Uniformity in mechanical properties throughout any one part and from one part to the next.**
2. **Deeper penetration of hardness with consequent higher over-all mechanical properties.**
3. **Reduction or elimination of retreats and rejections.**
4. **Reduction or elimination of warpage and cracking through uniformity of heat extraction.**

There is no charge for the use of this process. Furthermore, we will provide a metallurgical engineering analysis of your heat treating problems at no cost. It is simply part of our continuing effort to help you get the *most* out of the leaner alloy steels you're now getting.

UNITED STATES STEEL COMPANY, PITTSBURGH
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY COMPANY,
WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

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ELECTRIC FURNACE OR OPEN HEARTH

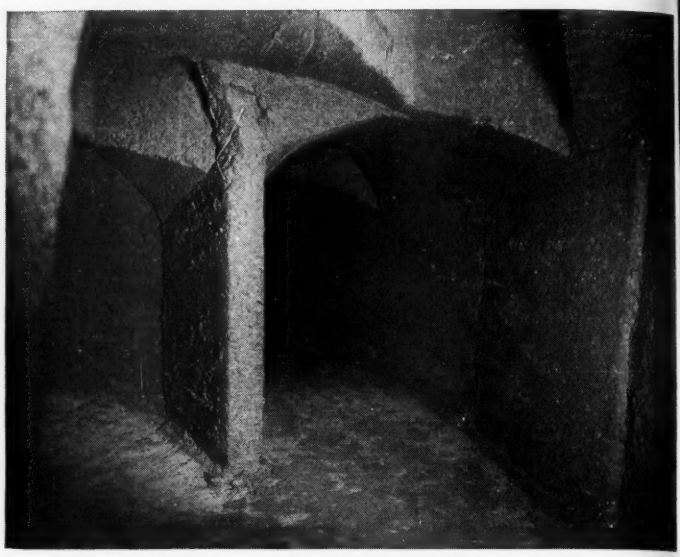
COMPLETE PRODUCTION FACILITIES IN CHICAGO OR PITTSBURGH

1-1678

UNITED STATES STEEL

The fastest refractory for flues and stacks is economical REFRACTORY CONCRETE

Waste gas coke oven flue at U. S. Steel's Fairless Works nears completion. One-piece Refractory Concrete construction speeded the job.



In open hearth flue (above) Refractory Concrete beneath heavy covering of fly ash is in excellent condition after 5 years' service. Note trim arches, unchipped walls, clean floors.

Refractory Concrete stack lining (below) at the Carrie Furnace, United States Steel Company, was simply shot by cement gun over reinforcing mesh.

REFRACTORY CONCRETE is the *one* refractory which may be simply cast in place or "shot" by cement gun . . . reaching service strength in 24 hours or less. This simple monolithic construction of flues, ducts and stack linings is far faster than laying up thousands of units. It means more dollar-saving, "ahead-of-schedule" jobs . . . less outage time for repairs.

IN FLUES AND STACKS, Refractory Concrete made with Lumnite* calcium-aluminate cement resists high temperatures and the corrosive action of sulphurous gases . . . withstands abrasive action of fly ash and high-velocity gases. It has low volume change, and so withstands severe thermal shock. Such qualities mean long service life and low upkeep, whether Refractory Concrete is used as a monolithic unit or as a protective lining.

FOR CONVENIENCE you may prefer to buy prepared Castables. These packaged mixtures of Lumnite and selected aggregates are tailor-made to meet your specific temperature and *insulation* requirements. Add only water. They are made by refractory manufacturers and sold through their dealers.

For further information write: Lumnite Division, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

**"LUMNITE" is the registered trade mark of the calcium-aluminate cement manufactured by Universal Atlas Cement Company.*

S-L-56

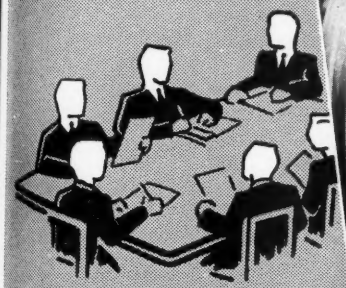
ATLAS® **LUMNITE for INDUSTRIAL CONCRETES**

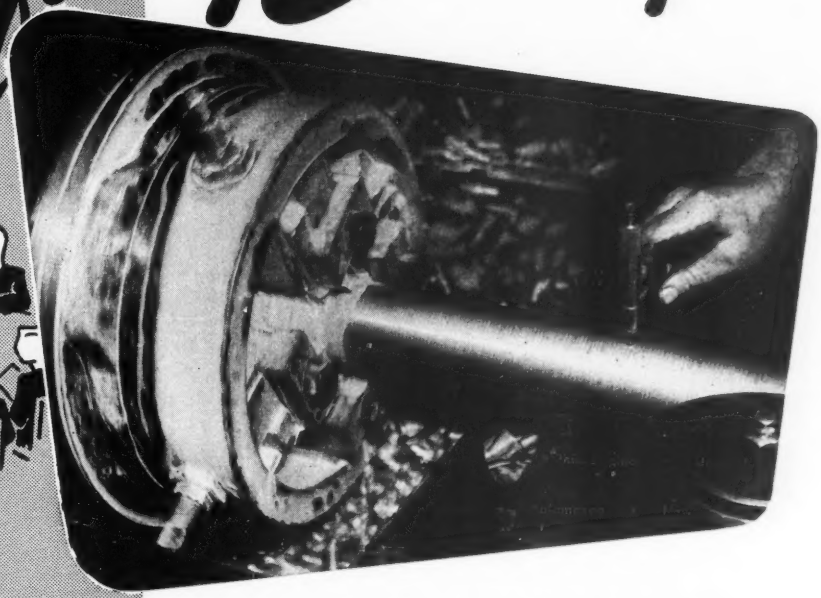
REFRACTORY, INSULATING, OVERNIGHT, CORROSION-RESISTANT

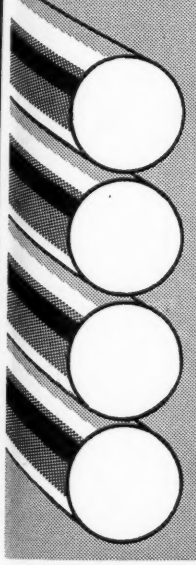
A UNIVERSAL ATLAS PRODUCT

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*

CALL FOR B&L... Shafting Service!







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TURNED AND POLISHED

DRAWN, GROUND AND POLISHED

TURNED, GROUND AND POLISHED

As pioneer producers of Cold Finished Shafting for almost three-score years, B&L mills are well equipped to give you a complete service in supplying the right type and grade of shafting for your particular job.

Our modern processes of production, plus a definite "follow-through" of testing and inspection, assure quality round bars of superior surface finish . . . and free from working strain, when required.

The use of B&L precision-made shafting gives you the advantages of balanced assemblies, smooth operation and increased life to drives, bearings and mountings.

B&L engineers are shafting specialists . . . let them help you select the proper Cold Finished Shafting to improve your product and lower your costs.

Steel Producers need your Hidden Scrap

BLISS & LAUGHLIN, INC.

GENERAL OFFICES: HARVEY, ILLINOIS

SINCE 1891

PLANTS: HARVEY, ILL. • BUFFALO, N. Y. • MANSFIELD, MASS.

SALES OFFICES IN ALL PRINCIPAL CITIES

Quantity
PRODUCTION
of
GREY IRON CASTINGS

ONE OF THE NATION'S
LARGEST AND MOST MODERN
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ESTABLISHED 1866

THE WHELAND COMPANY

FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS

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Cross-Bay Handling

COSTS LESS "Thru-the-Air"

WITH P&H OVERHEAD AND TRAV-LIFT CRANES

This idea may hold real advantages for you. At transfer points, loads can be moved at right angles with heavy duty and intermittent service cranes supplementing each other. It provides faster, more flexible movement of heavy loads "thru-the-air" to meet your production requirements. It helps keep manufacturing operations at top efficiency—prevents congestion and delays.

Let us show you how. As America's leading builder of overhead materials handling equipment, P&H puts a wealth of experience at your disposal. Our engineers can analyze your problems and recommend the best methods to coordinate your intra-plant handling service with "thru-the-air" speed and low costs.

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POWER SHOVELS • CRAWLER AND TRUCK CRANES • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • PRE-FAB HOMES

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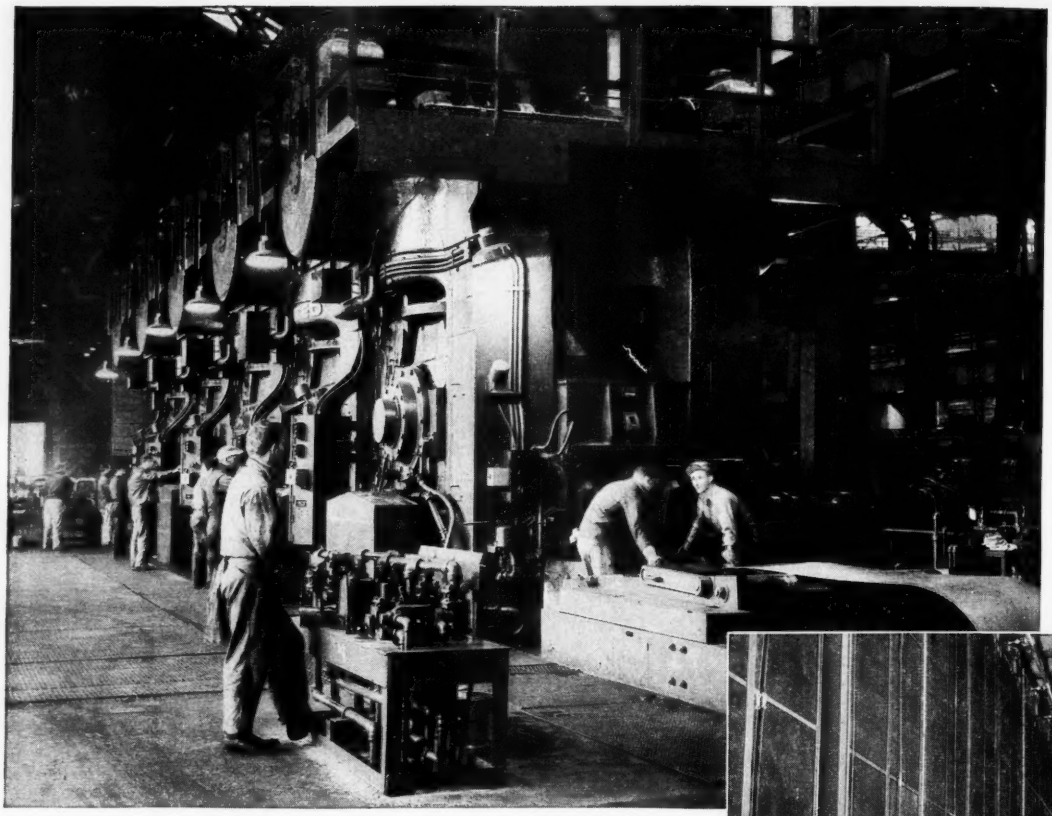


▲ *Tandem cold strip mill at Weirton Steel Company.*

ELECTRO-MATIC ▶
installation at Weirton.

super-clean air and
HIGH PRODUCTION SCHEDULES!

ELECTRO-MATIC Filters Protect Vital Mill Motors . . . reduce shut-downs and maintenance.

Today, *super-clean* air supplied by AAF Electro-Matic* precipitators protects thousands of mill motors against dust damage . . . and the resulting shut-downs that mean lost tonnage.

Here are the reasons why so many steel companies have installed Electro-Matics for mill motor ventilation. It is the *only* automatic, self-cleaning electronic precipitator and maintains highest cleaning efficiency over a wide range of particle sizes . . . from smoke to the largest air-borne material. Due to Electro-Matic's specially designed collector plates the filter curtain is non-clogging and insures uniform volumes of *super-clean* air. Also, exclusive self-cleaning feature reduces servicing to routine maintenance.

The Electro-Matic is made in standardized self-contained sections, which are easily installed in various arrangements to meet any air volume requirements. These may be equipped with oil clarifiers which continuously clean the Viscosine and simplify sludge removal.

For full story on *super-clean* air protection for mill motors call your nearby AAF representative or write to us for Engineering Bulletin No. 250 F.

***ELECTRO-MATIC** *Automatic Electronic Precipitator.*

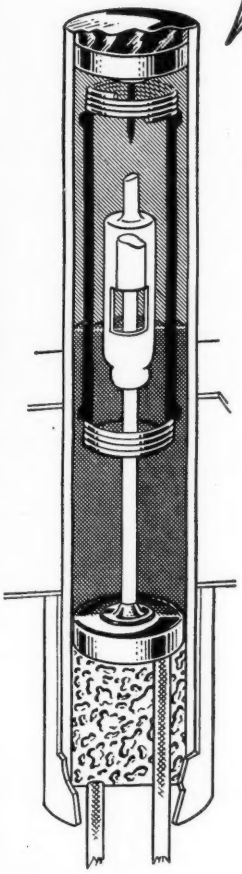
AAF

American Air Filter
COMPANY, INC.

443 Central Avenue, Louisville 8, Kentucky • In Canada: Darling Bros., Ltd., Montreal, P. Q.

Mercury Relay Stainless Tubing Specifications:

Type 304: Super Finish on ID
OD tolerance ±.003″
ID tolerance +.000″
—.006″



Super finish needed on the inside, to permit ID broaching without so much as a scratch or a pinhole! Tolerances have to be held just right on tube after tube after tube!

Right there you have this manufacturer's reason for specifying *Carpenter* Stainless Tubing over a long period of years.

When you have a Stainless Tubing problem that requires something extra in mill experience and product quality, it will pay you to get in touch with Carpenter. Let us work with your engineers in the development of *your* future products.

Slide Chart on Bending Stainless Tubing gives recommended bending radii and coil diameters for various sizes and gauges. To get good results on bending jobs and avoid waste of critical material, write for your copy.

THE CARPENTER STEEL COMPANY
Alloy Tube Division, Union, N. J.
Export Dept.: The Carpenter Steel Co., Reading, Pa.—"CARSTEELCO"

Carpenter
STAINLESS TUBING

Analysis → Tolerance → Finish

—guaranteed on every shipment

THE U.S. NEEDS YOUR STEEL SCRAP NOW

HOT FORMULA!

RF = LC + BP − R

Puts The Heat On Parts Production at Oliver

RF = LC + BP − R means: Radio Frequency heating equals Lower Costs plus Better Product minus Rejects . . . and here's how this formula paid off for the Oliver Corporation, Charles City, Iowa.

Oliver needed a heat treating process flexible enough to handle 15 different parts, ranging from ½ inch sleeves, lever arms and valve seats to long shafts. The hardening operation, requiring as many as 10 daily set-ups, had to supply varied parts of consistently high quality, or production would be delayed.

Oliver installed a 50 KW-450 KC RF Generator and work-handling equipment, all Westinghouse-built, which easily handled all parts, and required only about 10 minutes of an unskilled operator's time for changing set-ups. The RF induction heating process drastically cut costs 43%, and there were *no* rejects—with the net result that Oliver is able to produce a better tractor faster and cheaper.

See how this formula—or one of its many variations—has solved the heating problems of other manufacturers—problems that may parallel your own. Write for case history booklet, B-4782, Westinghouse Electric Corporation, Dept. S22, 2519 Wilkens Avenue, Baltimore 3, Md.

J-02233

YOU CAN BE SURE...IF IT'S

Westinghouse

INDUCTION HEATING

The strength of { steel }

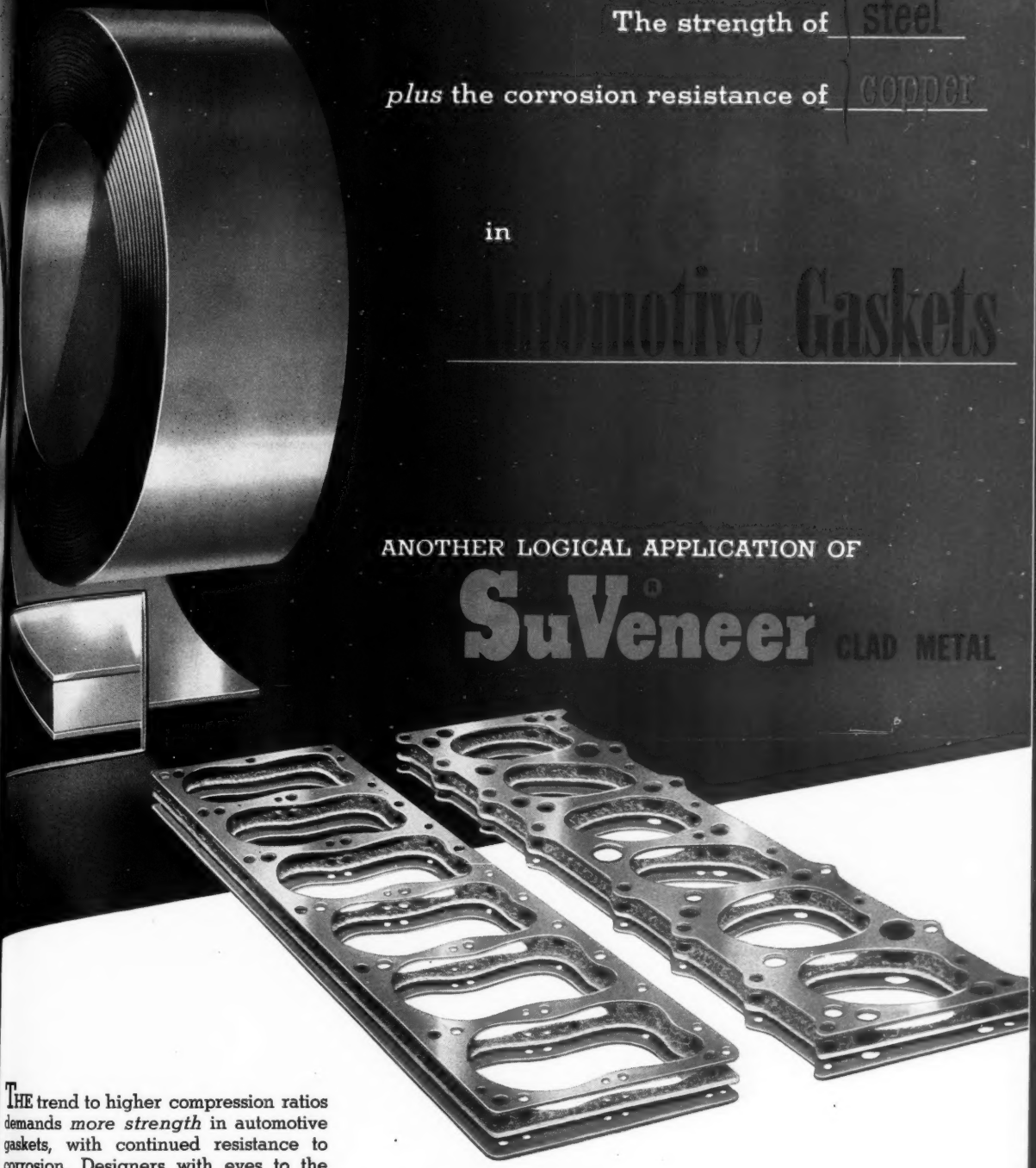
plus the corrosion resistance of { copper }

in

Automotive Gaskets

ANOTHER LOGICAL APPLICATION OF

SuVeneer® CLAD METAL



THE trend to higher compression ratios demands *more strength* in automotive gaskets, with continued resistance to corrosion. Designers with eyes to the future are planning wider eventual use of SuVeneer Clad Metal in this and many other applications . . . because of its strong inner core of strip steel with solid copper bonded inseparably to one or both sides, making a new and better material for tomorrow's finer products!

Superior Steel

CORPORATION

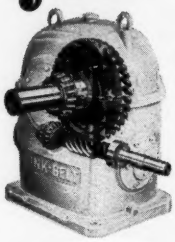
CARNEGIE, PENNSYLVANIA

Get the one speed reducer that best fits your job

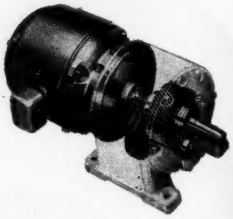
LINK-BELT builds all three types of enclosed gear drives

No ONE speed reducer solves *every* reduction problem. That's why Link-Belt builds all three — Worm, Helical and Herringbone Gear Drives. Your Link-Belt power transmission engineer will recommend the *right* reducer for your needs.

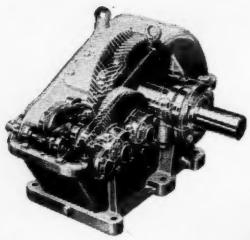
You can be sure you get the one that suits all your requirements for ratio, space, shaft position, shock loading and many other factors. Precision-engineered for quiet, economical power transmission, all Link-Belt drives will give you long service under the toughest operating conditions.



On Worm Gear Drives, write for Book 2324-A



On Gear-motor and Helical Gear Drives, write for Book 2247

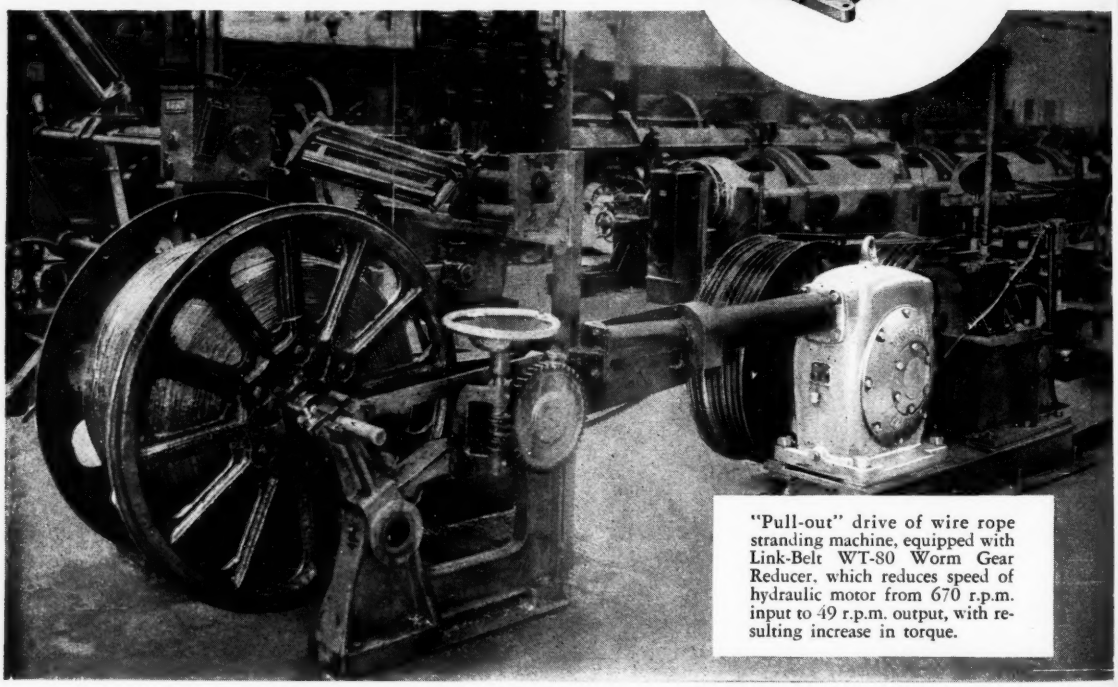


On Herring-bone Gear Drives, write for Book 2419

LINK-BELT

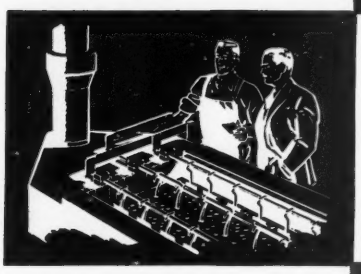
ENCLOSED GEAR DRIVES

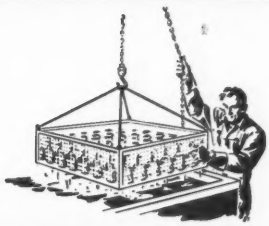
LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1. Minneapolis 5. San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Afric). Offices, Factory Branch Stores and Distributors in principal cities. 12,416-A

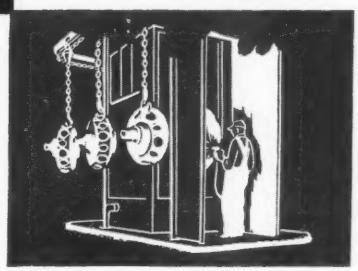


"Pull-out" drive of wire rope stranding machine, equipped with Link-Belt WT-80 Worm Gear Reducer, which reduces speed of hydraulic motor from 670 r.p.m. input to 49 r.p.m. output, with resulting increase in torque.

Want a hand with your... metal finishing problems?







Specialized help from United Chromium can save you time and expense in coating metals with metallic or organic finishes.

Problems involving finishing or protection of metals are United Chromium's specialty. With over 20 years successful service in the metal finishing field, U.C. electroplating and finishing engineers have an intimate knowledge of electroplated, organic, and chemically produced finishes. They can guide you to more efficient operations, show you how to get the results you want with speed and economy.

They can supply you with the right finish for decorative or defense work from the comprehensive, quality line of Unichrome Coatings for Metals. These are just a few widely used ones: Unichrome S.R.H.S. Chromium Solution which plates gun and airplane parts 20 to 80% faster than ordinary chromium . . . Unichrome Clear Dip for zinc and Unichrome Clear Enamels to provide a *combination* finish with durability and chromium-like brightness . . . Unichrome Dips with which to meet chromate-treating specifications for zinc and cadmium . . . Anozinc for corrosion-protection of zinc-plated steel shell cases.

Answers to many other metal finishing requirements are as close as the nearest United Chromium office. Write or phone about your problem.

UNITED CHROMIUM, INCORPORATED 100 East 42nd St., New York 17, N. Y.

Waterbury 20, Conn.-Detroit 20, Mich.-Chicago 4, Ill.-Los Angeles 13, Calif.
In Canada: United Chromium Limited, Toronto, Ont.

UNICHROME Trade Mark

COATINGS for METALS

RYERSON STEELGRAMS

Following are a few paragraphs on the steel situation as we see it here at Ryerson. We hope you will find them helpful in making the most of available steel.

More steel in prospect? There should be more steel moving out of warehouses after Jan. 1 as a result of new NPA ruling M-6A. This new regulation allows for stock replacement equal to 100% of average monthly receipts during the first 9 months of 1950. Included are all standard spec. steels — carbon, alloy and stainless. Previous warehouse allotment of most products was 85% of receipts during the same period. Despite increased allotment there probably will be very little more steel for the average user. Reason: more defense work on sub-contract level will probably absorb additional tonnage.

Closed-end CMP likely to be finally effective January 1 at the very latest. The few manufacturers still without allotments from NPA should hasten to apply.

Interim or lean alloys are in widespread use, now that standard analyses have practically disappeared from warehouse stocks. But reports from Ryerson alloy users indicate adoption of these unfamiliar steels is causing little or no difficulty—largely because Ryerson customers receive complete hardenability information with every alloy shipment.

Straight chrome stainless is finding wider acceptance as substitute for restricted nickel-bearing types. Example: Type 430 — a 17% chrome stainless — can be substituted for Type 302 in many applications involving mild corrosive action. Nation's most diversified stocks of straight chrome stainless are in Ryerson plants. On hand for quick shipment: Type 430 sheets in over 60 sizes and a complete range of gauges; Type 416 bars in more than 80 sizes; also Types 410 and 430 plates in the widely used thicknesses.

Steel buyers are urged to consider hot rolled, pickled & oiled, welded tubes in 11 gauge and 3/16" walls as an alternate for hard-to-get seamless tubes in these same sizes. Finish is extremely good—satisfactory for any application other than chrome plating. And a wide range of round and square sizes is in stock. Cold rolled welded tubing also in good supply.

Buyers report Government ratings for purchase of metal working machinery are now easier to get. Manufacturers of essential civilian goods, as well as those in defense work would do well to apply, since more liberal issuance of ratings will put unrated buyers even further down the list.

Big national company finds cost-saving substitute for restricted high tin babbitt. After exhaustive tests, this firm found performance of Glyco babbitt metal equal to that of higher priced hard-to-get tin babbitts. Product of an exclusive Ryerson formula, Glyco is available in five types covering all bearing applications.

Manufacturers finding it difficult to get aircraft alloys from stock can look forward to better days ahead. New amendment to Government regulation M-6A sets up machinery enabling warehouses to replenish stocks. Effects of this ruling should be evident in warehouse stocks of aircraft alloys early next year.

A reminder: Law requires written confirmation of orally given rated steel orders to be in hands of warehouse within 15 days. Since warehouses must report violations to Government, steel buyers are urged to confirm promptly.

Regardless of defense-created shortages, **we urge you to check with us.** We will always be happy to work closely with you.

JOSEPH T. RYERSON & SON, INC. STEEL-SERVICE PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • DETROIT • CINCINNATI CLEVELAND • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • 10-29-51

The Metalworking Outlook

November 12, 1951

In Effect: Capehart Amendment

Take another look at your price scales, for you'll soon get a chance to adjust them. At long last OPS has started putting the Capehart Amendment into effect. It was passed more than three months ago, as an amendment to the Defense Production Act. Under the Capehart law, manufacturers' price ceilings are based on pre-Korean prices, but taken into account may be material and labor cost increases up to July 26. Allowance will also be taken for increases in overhead costs, such as sales and advertising expenses.

In Step with Living Costs

No matter how you measure them, wages have kept pace with rising living costs. Straight-time hourly earnings are up 17 cents (12.5 per cent) above January, 1950, the base date of the stabilization program. Living costs rose a little more than 10 per cent. Higher hourly wages and a longer work week add $2.39 to the purchasing power of weekly earnings.

New Look at Defense Contracts

Attorney General J. Howard McGrath has been making speeches lately and his theme in most of them is: Small business must play an increasing part in the defense program. Significance: The Department of Justice is keeping a watchful eye on the distribution of defense contracts and may step in if it thinks an imbalance is developing, particularly if small companies aren't getting enough of the subcontracts. . . . The Commerce Department has just finished a study defining small business. All firms with less than 100 employees are small, all with more than 2500 are large. The classification of those in between varies according to the relative size of the industry grouping.

Loud but Not Frequent

Complaints thus far have been loud but not too numerous about NPA's elimination of the 10 per cent set-aside for first-come-first-served steel buyers in the last 15 days of the order acceptance period. The Senate's Small Business Committee sharply criticizes the action, but the House group is more moderate in its comments.

Aluminum for Copper?

Washington planners will soon complete a survey to determine to what extent aluminum can replace copper in both the mobilization program and the period afterward. If it's encouraging, watch for a flurry of approvals in aluminum expansion programs. Defense Production Administrator Manly Fleischmann says the future for world supplies of copper is "extremely cloudy."

Tools and Amortization

Production of metalworking equipment for rated purposes must be doubled in 1952, says Swan Bergstrom, director of NPA's Metalworking Equipment Division. That necessity is one of the reasons behind

Production-Engineering News—p. 75 The Market Outlook—p. 143

the revision of M-41 and the issuance of M-41A, both concerning machine tools. The net effect of the new regulations will be to prohibit virtually all unrated machine tool users from placing orders for additional equipment for the duration of the emergency. . . . Great Britain and the U. S. have placed orders for more than 70 per cent of Italy's machine tool production between now and March, 1953. The U. S. has ordered $4.2 million worth; Britain $14 million worth.

Ominous Committee

Businessmen who know their way around Washington are fearful of the new DPA-NPA security regulations. That's despite Administrator Fleischmann's assurances that his newly appointed Security Information Committee will have as its prime duty the dissemination of the maximum amount of information to the public. The fact that such a committee now exists is in itself ominous. Up until now NPA-DPA's dissemination of information has been outstandingly good. Will the excellent record continue?

Help for the Hard-Pressed

Soon to be scheduled will be government-sponsored clinics to develop more prime and subcontract opportunities for all manufacturers of less essential items who have been cut back sharply on allotments of steel, copper and aluminum. The idea is to get those companies into defense work so they will be entitled to better allotments. The time and place schedules for the assistance clinics will be announced shortly.

Straws in the Wind

Total purchase commitments involving the construction of Lone Star Steel Co.'s new steel and pipe mill in East Texas approximate $40 million to date. . . . More liberal overtime and holiday pay provisions have been written into the Weirton Steel Co. — Independent Steelworkers Union contract. . . . Ford Motor Co. will lay off about 30,000 at its Rouge plant for part or all of the first two weeks in December, because of model changeovers and NPA cuts in quotas. . . . Civilian employment in the executive branch of the government dropped 11,875 in September, the first decrease in 15 months. . . . NPA has asked steel companies to divert strip and other existing facilities to boost the output of heavy steel plate by 200,000 tons quarterly. . . . Chrysler Corp. will announce an experimental sports car powered by an adaptation of the Firepower engine.

What Industry Is Doing

The steelworkers this week formulate demands that promise to break the wage—and price—dikes (p. 47) . . . The situation in steel, copper and aluminum supplies won't ease until after mid-1952 (p. 49) . . . The scrap shortage is worsening and may affect the whole pig iron outlook (p. 50) . . . U. S. Steel Corp. will make its subsidiary companies divisions after Jan. 1 (p. 51) . . . Contract tool and die shops need at least 5000 more skilled employees (p. 53) . . . Machine tool builders need to prospect for subcontractors (p. 53) . . . The U. S. is hit by the failure of a West German scrap drive (p. 57).

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Each year thousands of different stampings in the small and medium range are shipped from our Pressed Products Plant in quantities to satisfy any needs.

Stamped — Formed — Machined — Hardened and Ground — each serving industry at its best. We aim to carry the largest and most diversified range of steel raw material in the midwest—ready to serve you.

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NICKEL ALLOY IRONS
develop improved properties
plus all the basic advantages of plain cast iron

PLAIN GRAY IRON is, structurally, a steel matrix containing graphite flakes. Engineering, physical, processing and service properties are wholly dependent upon the character and disposition of these flakes, and upon the nature of the matrix.

The matrix of nickel alloyed irons closely resembles the pearlitic matrix found in high carbon steels, whereas the matrix of ordinary plain iron resembles that found in low carbon steels. Compositions of nickel alloy irons can be adjusted to reduce "chill" in thin sections without risk of forming "spongy" regions in heavy sections. This promotes uniform strength, improved machinability, pressure tightness and wear resistance.

Hardness in nickel cast irons results from improvement of the matrix. Chilled areas and hard carbides, which impair machinability, are obviated. Nickel improves response to heat treating. In fact, use of nickel alone or with other alloying elements plays an important part in meeting a variety of requirements.

Accordingly . . . nickel alloyed irons permit production of castings with high levels of the following properties:

Strength

Tensile and transverse strengths of castings are greatly increased by the addition of nickel to cast irons of properly adjusted base mixture. The ratio of compressive strength to tensile strength is retained. Greater uniformity of strength in thick and thin sections is achieved.

The International Nickel Company, Inc.
Dept. S, 67 Wall St., New York 5, N. Y.

Please send me booklet entitled, "Guide to the Selection of Engineering Cast Irons."

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Elasticity

The elastic modulus increases with strength. In this respect nickel-containing irons of the high strength type possess good stiffness and do not deform permanently under loads that would be damaging to irons of lower elastic modulus.

Damping Capacity

The damping capacity inherent in gray cast iron is not impaired by the presence of nickel.

Wear Resistance

The uniformly pearlitic matrix of nickel cast irons appreciably improves wear resistance. The uniformly fine graphite flake distribution, achieved in suitably processed irons *without formation of a poor wearing dendritic condition,* affords optimum resistance to wear and galling.

Pressure Tightness

Characterized by dense grain structure and fine dispersion of graphite throughout, nickel alloy irons are close-grained and offer an extraordinary degree of pressure tightness under high hydrostatic pressures, without sacrificing machinability.

Applications

Heavy machinery frames and *beds* are typical of cast parts that benefit from the rigidity and good damping capacity of nickel cast irons. *Cylinder* and *pump liners, gears, dies, machine tool ways, saddles* and *tables* exemplify parts produced in nickel irons to assure greatly increased strength and wear resistance. And nickel alloyed iron is used for *heavy duty brake drums* to resist heat checking, thermal shock, wear and galling. The nickel cast irons are readily heat treated, and respond particularly well to flame and induction hardening.

At the present time, the bulk of the nickel produced is being diverted to defense. Through application to the appropriate authorities, nickel is obtainable for the production of engineering nickel cast irons for many end uses in defense and defense supporting industries.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

Need Clear-Cut Majorities

Results of last Tuesday's elections in the United States did not reveal any important national trend that can be translated into terms of prophecy for next year's general election. In many instances, local candidates who oppose policies of the Truman administration were elected to office and in fewer cases the opposite was true. The margin of anti-Truman victories was not conclusive.

In this respect the results were similar to those of the British elections of Oct. 25. Moreover, the lack of a workable majority in Britain and in the United States is a weakness that exists in many free nations of the world. France and Italy have weak, uncertain governments because no party can muster sufficient support to enable it to function effectively.

An excellent example of how lack of a substantial majority hamstrings a government is provided by the problem confronted by Winston Churchill in denationalizing the British steel industry. An important detail in the denationalizing process is to find private investors who will buy shares of stock in steel companies now owned by the government. Obviously investors, conscious of the slender margin of seats held by Conservatives, wonder whether British steel, if denationalized, will remain so. May not the labor government be back in power in another six months or so?

This uncertainty may make it impossible to return British steel to private ownership until an anti-socialist government in Britain gains a majority strong enough to support bold administrative leadership. The same idea holds true in many other countries, including our own. We can't enjoy good government unless a workable majority of the people will support the administration.

Throughout the United States last Tuesday were a few cases where civic-minded persons using new techniques and disregarding orthodox politicians who said "it can't be done," did get out an unprecedented number of voters and elected high grade officials to jobs that long had been held by incompetents. If the formulas of success in these isolated instances could be applied wholesale in the campaigns of 1952, the result might be the clear-cut majority we need for good government.

E. L. Shaner

EDITOR-IN-CHIEF

REAL TROUBLE AHEAD: Meetings of the executive board of United Steelworkers of America-CIO in Atlantic City next Wednesday and its wage policy committee on Thursday and Friday may result in decisions of great importance to long-range policies of our government on inflation.

Everybody takes it for granted that USA will ask for wage increases far beyond reason. This is part of the bargaining technique of this cock-

eyed era. It is likely that employers and government will resist enough to convince the public that they are not willing conspirators in a deal that certainly will give fresh impetus to inflation. In setting the stage for the final showdown there will be wildcat strikes, probably more serious than the sporadic ones of recent weeks.

The important thing is that ailing Philip Murray holds a whip-hand over aspirants to his job who would be poison. Without him, CIO might disintegrate. —p. 47

* * *

MISAPPLIED MANPOWER: Members of the National Tool & Die Manufacturers Association attending the annual convention at St. Louis were told that the 500 contract tool and die shops in the country need at least 5000 more skilled employees. At the same meeting, Col. Lewis F. Kosch, chief of the Manpower Division of the Selective Service System, advised tool and die employers not to count on holding men under 26 years of age. He likened the existing military manpower pool to a joint checking account upon which a number of persons are drawing without keeping each other informed.

This frank statement points to a situation that is bad and growing worse. More men are being inducted into some branches of the armed services than are needed. In too many cases, men possessing special skills are assigned to military jobs where these skills are wasted. Who gains when an expert in a metalworking shop dons a uniform only to be assigned to sorting mail in Korea? —pp. 53, 80

* * *

GERMAN AID FALTERS: In September the West German government and the Scrap Dealers Association initiated an iron and steel scrap drive which was intended to ease shortages in several nations. The first 325,000 metric tons collected each month were to be reserved for German home consumption. The next 50,000 tons were to be exported—60 per cent to Great Britain and the United States and 40 per cent to other countries, including Sweden. Monthly collections exceeding 375,000 tons were to be divided equally between German home use and foreign buyers.

During the first month of the drive 327,000 tons were collected, of which only 2000 tons are earmarked for export in November. Only a few hundred tons of this will be available for the United States instead of the 15,000 or more tons that could have been counted upon if the drive had been as successful as anticipated. This disappointment is another good reason for putting more heat under our scrap drive here at home. —p. 57

* * *

VERSATILE SALESMEN: Inquiries directed to a number of representative metalworking companies have brought forth responses which indicate that while currently the need for direct selling of their products is limited, sales forces are as large if not larger than they were before the Korean flare-up and all salesmen are kept busy.

This is a wholesome situation because the day will come when intelligent, energetic sales effort again will be important. Right now sales personnel may not be "selling" in the orthodox sense, but salesmen are doing jobs other than selling that will make them better salesmen when keen competition returns. Some of the trouble shooting, expediting, pacifying, missionary work and other chores—some of them far beyond the ordinary call of duty—provide wonderful experience for the difficult days ahead. —p. 58

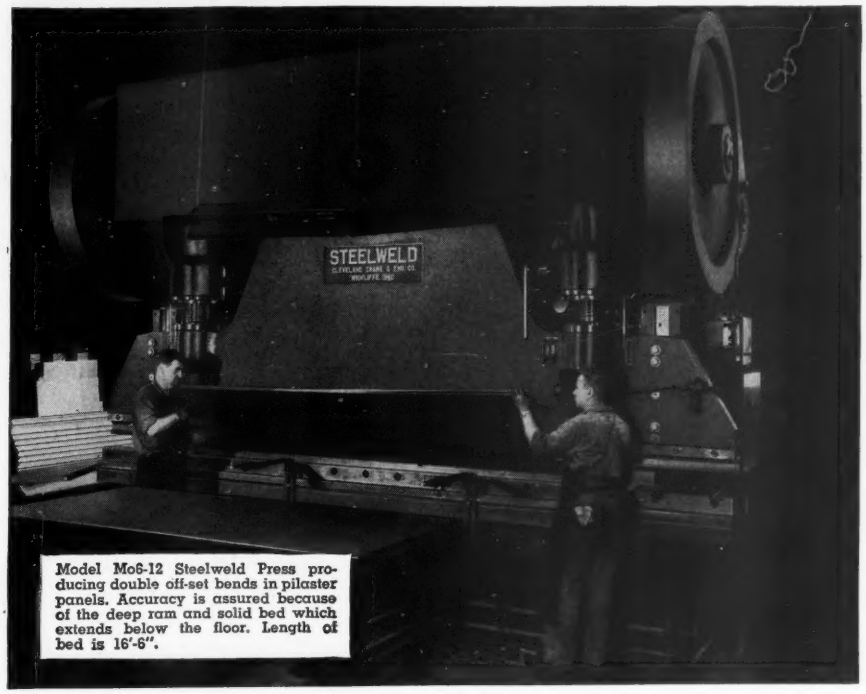
* * *

HEAT DOES IT BETTER: Hot spraying of lacquer is gaining ground rapidly, especially on numerous items of military equipment. Thinning lacquer by means of heat instead of by extra solvents has the advantage of fewer coats, less labor and less solvent. These more than offset the added cost of the equipment required for heating.

Indicative of the present upsurge in the popularity of hot spraying is the fact that at least 4000 heating units now are in operation in the finishing industry and that about 1500 of these were installed during the past year. Eight or more companies have developed and are marketing heating units designed especially for the hot spraying of lacquer. Practically all specifications of the Army, Navy and Air Force relating to coatings are being amended or adjusted to permit contractors to employ hot spraying on orders to which it is adapted. —p. 76

Special Press features

SPEED PRODUCTION



Model Mo6-12 Steelweld Press producing double off-set bends in pilaster panels. Accuracy is assured because of the deep ram and solid bed which extends below the floor. Length of bed is 16'-6".

It takes power to make long sharp bends. It takes size and design to assure accuracy. The Mills Company, Cleveland, Ohio, well-known manufacturers of fine metal partitions achieve both with their big 500 ton capacity Steelweld Press.

But more! They also obtain speed and safety. Their machine is provided with several features that are extremely advantageous:

1. Air-electric control for high production.
2. Electric foot switches for easy fatigueless operation.
3. Ram-positioning selector for stopping ram automatically at pre-selected points.
4. Two speeds, 7 or 21 strokes per minute for best operating speed.
5. Reversing flywheel for quick stopping or reversing of ram at any point.
6. Safety dual control permitting operation only when both operators are ready.

The Mills Company are proud of their modern Steelweld Press. It is the largest of several press brakes in their plant. It is in continuous operation, two shifts a day.

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STEELWELD

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"Let's try it without the stretcher levelling," said Art

For some time, an Inland Customer, who makes farm implements, had been buying 62½" x 128" sixteen gage cold rolled sheets for a certain part and had always specified that they be stretcher levelled and resquared to insure extra flatness.

The process of stretcher levelling and resquaring at the mill added substantially to the cost of the cold rolled sheets. Art Brackett*, the Inland sales representative on this account, questioned the need for this costly operation.

One day, on a visit to the customer's plant, he asked to take a look at the part being fabricated from this large sheet. He found that the stretcher levelled and resquared sheets were shipped from Inland to an independent fabricator for blanking. They were then shipped to Art's customer who further fabricated them and welded on bracing and framing sections before assembling them on his implements.

In talking to his customer's purchasing agent and production manager, Art suggested that the extra flatness achieved by stretcher levelling was lost by the time the sheet was assembled on the finished product and was, therefore, unnecessary. The customer changed his steel specification for this part, eliminating stretcher levelling and resquaring.

Making Steel Do Your Job Wel Is Inland's Job.

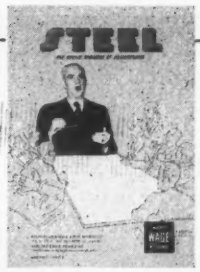
Result: A saving for Inland's customer of over $4.00 per implement—a saving that has already run into thousands of dollars! INLAND STEEL COMPANY, 38 South Dearborn Street, Chicago 3, Illinois.

*Names used are fictitious

Your Scrap is Needed by the Steel Industry for National Defense

Drive Starts on Steel Wages

The steelworkers this week formulate demands that promise to break the wage—and price—dikes. They may ask 25 cents and strike to bolster their stand



The bell is sounding for the next round in the fight for higher wages as Phil Murray's United Steelworkers of America meet to plan contract negotiation strategy. That complicated game of leapfrog between wages and prices will start anew if the government's wage-price formula is shattered.

ORGANIZED LABOR, spearheaded by the United Steelworkers of America-CIO, this week starts its concerted drive to break the nation's wage—and price—formula.

Industry's consensus: The steelworkers will doubtlessly break a hole through the wage ceilings, which in turn will force increases in prices, but the victory won't be as easy or as decisive as many people now believe. That's because the steel companies have a good case against wage boosts and because the government, the ultimate arbiter in the steel case, is fed up with labor's antics since the Korean War started and won't be as lenient as it would have been 18 months ago.

Facts of the Matter—USA's executive board meets in Atlantic City, N. J., Nov. 14, and the wage policy committee convenes there Nov. 15 and 16. At those meetings will be hammered out what the union will ask the major steel companies on or before Dec. 1. Because of tactical considerations, the steelworkers may not make public immediately their cents-per-hour demands. Odds are that the union will present initial proposals that would cost the steel companies about 25 cents an hour per worker. On the 25-cent ticket will be 15 cents as an actual pay boost. The remainder will be made up in their demands for six paid holidays and Saturday and Sunday overtime. To lessen the danger of public ill will, the steelworkers may claim that just 5 cents of the 15-cent boost is an actual increase and that 10 cents is for "the workers' increased speed and efficiency." Under existing laws and regulations, the steelworkers are actually entitled to just 3.9 cents more per hour.

The 25-cent package is a dickering figure, and Philip Murray and his steelworkers may settle for around 15 cents if the pressure gets great. Talks between union and steel company representatives probably won't reach agreements, largely because the steel companies don't want to shoulder responsibility for breaking the wage formula. The matter will be referred to the White House just before Dec. 31 when most steel contracts expire.

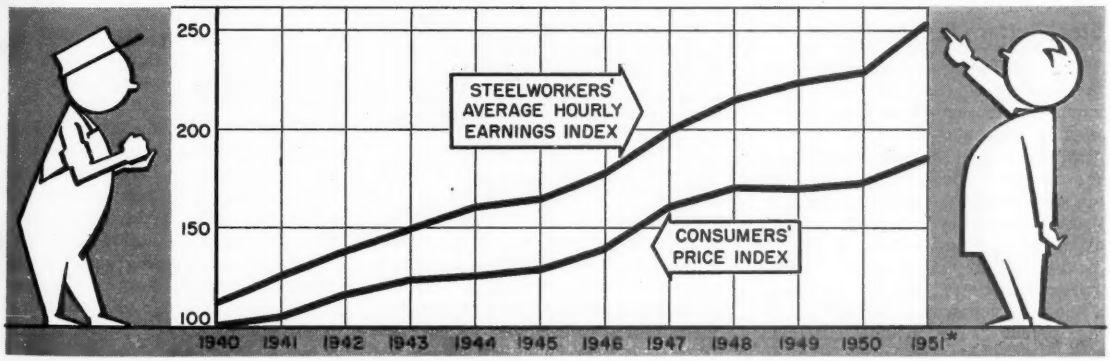
Strike Possible—To force the government's hand, the USA could call at least a token strike in January. It wouldn't last long and it might not be industrywide, but it would be used to get a quick decision from the Wage Stabilization Board or any other special panel set up to hear the case. Wildcat steel strikes, always common around contract negotiation time, have been hampering steel output for the last six weeks and will probably continue to do so until the whole wage matter is finally resolved.

In the forthcoming negotiations between the steelworkers and the steel companies, the matter of the guaranteed annual wage will be brought up, but it won't be a life or death proposition and may fade out of the picture as talks progress. Pension questions are not expected this year, but the USA may talk about, but not press for, an escalator arrangement in pension funds to give the retired steelworker $100 per month plus a sum commensurate with inflation since the pension agreements were signed. The steelworkers are going to be more persistent in demands for the union shop and elimination of wage differentials between the northern and southern steel districts.

Pro and Con — The steelworkers' major argument to support its demands will be the rising cost of living. The steel companies will counter to show that the wage increases for the industry have outpaced the consumers' price index (see the charts). Industry representatives can

Steelworkers' Wages Outpace Cost of Living

(Base Period: 1935-1939 = 100)



*Index computed on first 8 months of 1951 for steel earnings, first 9 months for prices. Price index prepared by Bureau of Labor Statistics; steel earnings index by STEEL from American Iron & Steel Institute hourly pay figures.

NEA

TEMPER, TEMPER: Michael V. DiSalle, director of OPS, chats with Philip Murray, president of CIO, at the 13th annual CIO convention in New York. D Salle asked labor to "temper demands" for more pay, but the CIO served immediate notice that it would fight for higher wages and liberal government rules on wages

also point out that steel earnings in the third quarter were 40 per cent below those for the same quarter a year ago and 30 per cent below the second quarter. Industry generally found its profits had dropped 25 per cent from the second to the third quarter this year.

Steelmen will argue that their profit drop will necessitate steel price increases in case the government does award the USA more than the 3.9-cent legal increase. That the steelworkers will win something is seen in WSB Chairman Nathan P. Finsinger's sad admission that it would be a "major miracle" if the board held the present wage line this winter. That the steel industry will gain price increases is hinted in the fact that OPS has already begun to survey the present steel price scale with an eye to the future.

Steel Pattern Far-reaching

The outcome in steel will set the precedent for wage settlements in much of the rest of industry.

Many contracts not yet due for negotiation will be patterned after the steel decision, and a number of increases already agreed to by segments of industry but pending WSB approval may be modified to fit the mold or finally O.K.'d by the stabilization agency if they do conform.

Wage agreements that are pending before WSB include contracts signed by rubber companies granting 13 cents an hour to hourly employees and sliding scale provisions General Electric Co. agreed to with its CIO electrical workers. The left-wing UE is holding out for more and, ironically could get it, to the chagrin of the CIO rivals, if the CIO steelworkers win decisive gains. GE gave the IUE a 2.5 per cent increase and a cost-of-living adjustment.

The steel decision could even affect the outcome of the protracted labor talks between the railroads and the firemen and engineer brotherhoods. A strike had been called on four railroads for last Thursday, but it was postponed for 60 days when President Truman moved in and invoked fact-finding provisions of the Railway Labor Act. That will move the rail strike deadline to January, when the steel case will also be reaching a climax.

John L. Lewis' contracts with the coal operators don't expire until Mar. 31; he may find the steel decision a handy wedge.

Sporadic strikes among UAW locals, some of them formally called by UAW leadership, some of them wildcatters, indicate growing restlessness in the auto union even though many contracts run until 1955.

AFL Submits Wage Plan

American Federation of Labor members of the WSB have proposed a new wage policy for the country under which wage and salary increases would be permitted for increased production and efficiency.

The CIO board members last week had not endorsed the idea. That's indicative of a growing coolness between the two largest unions. At CIO convention in New York, President Philip Murray earlier turned down AFL proposals for merger.

Tool, Die Makers Relieved

Tool and die makers are heaving sighs of relief now that WSB has turned down a proposal for especially high wage ceilings for about 75,000 workers in industry.

Tool and die men believe they will be protected against labor pirating by WSB regulations already in effect and that any special treatment would have been unwarranted. Wage inequities which had hampered tool and die shops and which had contributed to a pirating situation have been relieved by WSB rulings. Amendment 2 to General Wage Regulation 5 permits companies, including tool and die shops, to give merit increases. GWR 8 allows shops to pay a cost-of-living increase. GWR 17 sets up procedures by which raises can be given when there are inter-plant inequities.

Engineers' Salaries May Rise

The Salary Stabilization Board will soon issue a new regulation to permit salary increases for engineers.

Employment Steady

Employment conditions showed little change between September and October, according to the latest Census Bureau figures.

Total civilian employment is estimated at 61,836,000 in the week ending Oct. 13, about the same as in the week ending Sept. 8. Unemployment, which usually drops to a seasonal low in October, this year showed little change from September. But the October level of 1,616,000 was as low as any recorded in the postwar period.

Majority Reports on Pensions

Public and labor members of a tripartite panel on health, welfare and pension plans have just signed a report and submitted it to the Wage Stabilization Board. The industry members dissented.

The majority members recommend that pension programs be treated separately from health and welfare programs under stabilization policy. They believe that programs need not have prior WSB approval when: Establishment or amendment of profit-sharing plans, approved by the Bureau of Internal Revenue, do not provide the payment of any immediate benefits prior to an employee's death,

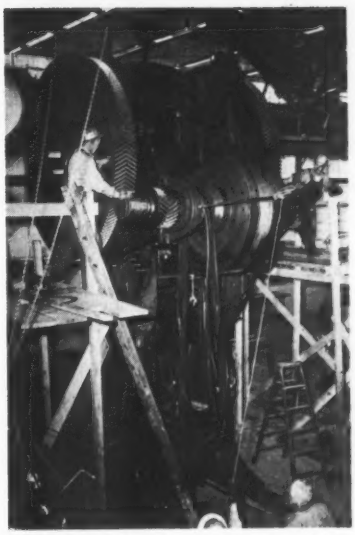
retirement or permanent disability; amendments of existing pension programs do not require increased employer payments; the amendment of existing pension programs adjusts pension benefits either to maintain the same relationship beween any such benefit and the costs of living or maintain the same relationship between any such benefit and wage and salary levels in the company; the establishment or amendment by an employer of a pension program is equivalent to an existing program in any of his establishments or the extension of an existing program to cover a new group of similar employees; the establishment or amendment of a pension plan does not exceed the limits of accepted industrial practice as evidenced by precedents established by a plan approved by the Bureau of Internal Revenue; establishment or amendment of a health and welfare program calls for providing life insurance by the term insurance or related form and does not permit payment of benefits before the insured reaches 65, dies or is permanently disabled.

The majority on the panel thinks that new programs that don't match any of the above conditions should be submitted to the WSB for approval. The industry members dissented from the majority findings, because they thought them too broad.

Tempest in a Teapot

An erroneous impression has appeared in some newspapers that WSB has approved a new incentive plan at Jones & Laughlin Steel Corp. which will allow workers to increase their earnings as much as 35 per cent.

WSB did no such thing. It simply gave J & L permission to return to an old type of incentive pay plan which had been in effect for some years before 1949. Under that old plan, as under any incentive system, a worker was paid an amount over his standard hourly rate varying according to his output. In 1949 the company instituted a new and slightly different plan. Only 7 per cent of J & L's 10,000 incentive-pay workers have transferred to the 1949 system. Experience has shown that under the new plan some workers can't earn the expected 35 per cent above the standard hourly rate, which a normal worker is supposed to get. J & L petitioned to return to the old plan, with some modifications, to assure that the average worker can reach the 35 per cent figure, a normal one for most incentive systems.



BLISSFUL: Indicative of the aircraft industry trend toward heavier machinery to make stronger, larger parts for faster, bigger planes is this mammoth press. It was built to Lockheed Aircraft Corp.'s specification by E. W. Bliss Co. The 1000-ton impact press will quick form parts made of aluminum alloys and will save about $50,000 a year, Lockheed estimates

Materials Noose Will Be Tight Till July

Even if mobilization's timetable remains unchanged there's little chance you'll get more steel, copper or aluminum in the first half

COUNT ON little relief in steel, copper and aluminum supplies before mid-'52.

Relaxing of materials clamps even then assumes that the mobilization timetable will remain unchanged. On the basis of present defense requirements there will still be acute shortages lasting into 1953.

Bitter Pills—Worst situation will be in copper; it promises to be in short supply indefinitely. Aluminum will ease gradually after midyear as facilities now abuilding go into operation. Steel plates will be more abundant in late '52 as new mills start rolling. Structurals will be about as plentiful as hens' teeth till 1953. Most favorable change in the supply picture after next July: Steel sheets, from which most steel products are made.

If the sensational aluminum expansion program continues unmolested, there will be about 60 per cent more aluminum in the first half of 1953 than at present. NPA is now studying possible substitutions of aluminum for copper, with a view to making these effective in the third quarter of next year. "If I were a manufacturer and using large amounts of copper," says NPA Administrator Manly Fleischmann, "I would have my design people work up substitutions of aluminum for copper wherever possible."

Barter—Possible source of badly needed structural steel shapes (particularly for highways and schools) is seen in surplus British capacity. Government officials are now working up a deal to swap some high-priced conversion steel ingots from a West Coast producer for heavy structurals.

A scheme for control of steel product mix to insure availability of enough steel in each form to fill first quarter CMP allotments is currently being studied by NPA. Production directives would be issued to balance the total of first quarter allotments.

For the Record—Misunderstanding has resulted, say government officials, from steel industry statements that the 18.5 million ton steel expansion program will by itself be sufficient to meet military schedules. That's true in itself, government men concede, but how about the increase in defense-support activities? They need increased quantities of steel too. This is not only a direct military program, they say, but a mobilization program, with ships, power plants, mines, petroleum products, etc., just as necessary as guns and airplanes. One official puts it this way: "The furnace in a defense worker's home at Oak Ridge is as important to the mobilization program as a piece of equipment for the Oak Ridge laboratory."

One important lesson was learned from over-allotment of CMP materials in third and fourth quarters of this year: Rate of attrition of allotment isn't so great now as it was during World War II. Allocations this year have been about 112 per cent of production, same rate that proved realistic before. In light of recent experience this figure will probably be reduced to 110 per cent of production. The change would apply to second quarter allotments—it's already too late to modify first quarter allowances, except for plates and structural shapes. NPA, finding attrition rate in these products is considerably less than in most other steel products, will cut first quarter allotments of these forms sharply.

Pyramid's Base—The steel indus-

try won't have many expanded facilities ready for operation until well after their original completion dates. That's because the industry isn't getting enough of its own product to maintain construction schedules. Only 51 per cent of the structurals and plates needed are being received. Gaps here will start to be filled in the third quarter of 1952.

Components shortages have caused a lot of hair-tearing, not only in machine tools but in other types of assembly as well. Badly needed machine tools, completed except for a chuck or some other part, are accumulating at builders' plants. NPA is considering adoption of a system of directives to control production of all components.

Fourth Quarter Booked Solid

If you have not succeeded in placing your CMP fourth quarter steel allotment, the chances are that you will be unable to do so.

Frank T. McCue, assistant to the director, NPA Iron and Steel Division, who was designated several weeks ago to look into this matter, says that efforts to help consumers to find a home for their tickets have not been as fruitful as originally hoped, and from now on the result of such efforts will be negligible. This is because mills generally are booked solid through the fourth quarter; many of them, in fact, will take carryovers into the first quarter.

Mr. McCue has this word of caution: "Many consumers got into trouble in the fourth quarter by attempting to get on mill schedules whereas they normally buy from warehouses. Their purpose, of course, was to enjoy price and freight advantages. The majority of them failed to get their allotments accepted by the mills and in the meantime lost their chances of early deliveries from their regular warehouse sources."

Says Mr. McCue: "This is a poor time to replace one source of supply with another. If normally you are a warehouse customer, you will be wise to continue to rely on your warehouse. By so doing you are almost certain to get your steel—for NPA directives, recognizing the importance of the warehouse in the present emergency situation, provide for distribution of an estimated 19 per cent of the entire steel output through the warehouses."

Construction Volume Drops

Shortages of material retarded almost all kinds of building in October, resulting in a more than seasonal decline, says the Building Materials Division of the U. S. Commerce Department.

Total value of new construction put in place in October amounted to about $2.7 billion, off 5 per cent from the September total and 3 per cent less than the October, 1950, total. New homebuilding increased slightly. Military and defense plant construction showed further moderate increases. But delays in construction projects extended to the basic steel and electric power expansion programs.

Construction came completely under CMP Oct. 1. When supplies of controlled materials on hand before that date are used up, the amounts of various types of building that can be carried on will depend largely on allotments of steel, copper and aluminum. 'Structural steel was the principal limiting factor in October; it will probably continue to be so for the remainder of the year. Within a short time, though, availability of copper items may supersede structural steel as the determining factor in the volume of construction activity attained.

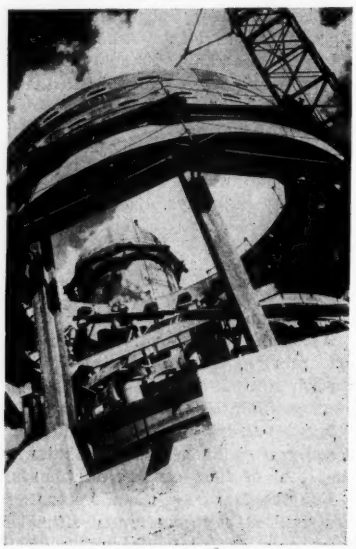
Pig Iron Must Shoulder Scrap Load

Coke and pig iron expansions in long-term balance, says steel industry, but chronic scrap shortage would raise hob with blast furnace program

THE SCRAP shortage is worsening.

Thus far little steel ingot or casting production has been lost because of it, but the danger mounts as winter, the season for lower scrap collections, comes upon us with an unusual rush when stocks are exceptionally low.

Short-Lived? — Scrap shortages are usually short-lived affairs because the bellows action of higher prices or great publicity about the problem can usually bring out dormant material. But now prices are frozen, the bad weather is cutting valuable weeks off the high collection season and the government is moving at a snail's pace to return to the scrap cycle battlefield material lying around in the South Pacific and in Korea.



REPUBLIC'S HIGH PRESSURE STACK
. . . more pig iron with less coke

On a near-term basis, the scrap difficulties are having serious effects on pig iron supplies. For the past month or two pig iron has been a little easier to get, partly because of reduced activities in foundries, but now iron is tightening again as the pig iron ratio in open hearths goes up to counterbalance lower scrap tonnages.

Chronic?—If the scrap scarcity becomes chronic, or at least lasts for the next two years, it will raise hob with the steel industry's entire blast furnace expansion program. Even figuring on a quick easing in scrap supplies, the government is charging that steel companies haven't expanded their pig iron—and coke—capacities commensurately with their steelmaking potentials (STEEL, Oct. 1, p. 35). In a query on that subject, STEEL interviewed every major steel company in the U. S. on the government allegation. All say that as far as their own operations are concerned, their blast-furnace, coke oven and steelmaking expansions are in balance on a long term basis. But many also point out that a chronic scrap shortage would unbalance the situation, and the government charge, as far as pig iron is concerned, would turn out to be correct. Coke would not be affected. A few coke oven and blast furnace operators admit that a coke and iron imbalance conceivably could develop over the long pull when foundry needs are figured in the whole situation.

As the expansion picture now shapes up, these capacities will be available by mid-1953: Pig iron and ferromanganese, 82 million net tons, compared with 72.6 million tons as of last Jan. 1; coke, 77 or 78 million net tons, compared with 72.5 million

as of last Jan. 1; steel ingots, 118 million tons, compared with 104.5 million as of last Jan. 1. Government people figure we'll have a shortage of about 6 million tons of pig iron and about 3 million tons of coke by 1953.

The Big "If"—Many steel industry experts think those estimates are high—if we escape a chronic scrap shortage. They point out that the industry is switching rapidly to the high top pressure blast furnace technique which boosts the output of the unit about 12 per cent without increasing its size and lowers the consumption of coke about 10 per cent. Republic Steel Corp. has converted 7 of its 21 blast furnaces to pressure blowing and an eighth unit is abuilding that will incorporate the system. Armco Steel Corp. and Great Lakes Steel Corp. are installing the system; U. S. Steel Co. is considering it for its Fairless Works furnaces. Another factor that will boost blast furnace output without the need to enlarge the unit is richer iron ores, now coming in greater quantities from Venezuela and Liberia and in the form of taconites from the Lake Superior region.

Nevertheless, Washington people are still concerned about a shortage of furnaces and ovens. "We are negotiating with five or six companies to get them to launch new pig iron and coke expansions on the basis of a liberal tax-treatment incentive, and possibly with government loans," a spokesman told STEEL. At least one steel company is going ahead with coke and steel expansions in addition to the ones already figured in the original 1950-1953 steel program. Bethlehem Steel Co. has authorized $40 million for further expansion. Part of that sum will be used to boost capacity of two blast furnaces and to rebuild some coke ovens at Sparrows Pt., Md.

Follansbee Steel To Expand

Re-entry into the field of primary steel production is being made by Follansbee Steel Corp.

It was granted a government certificate of necessity for a $33 million expansion program which will provide a new electric furnace melt shop, a new blooming mill and a continuous hot strip mill. The new facilities will be built at Follansbee, W. Va., adjacent to the company's present plant.

Now that the company has a certificate of necessity it is studying means of financing and engineering details of the operating equipment.

M. A. Follansbee, president, told STEEL the company contemplates either five or seven 70-ton electric arc furnaces to produce ingots for rolling. The blooming mill will supply a four-stand or five-stand 54-inch four-high strip mill whose monthly estimated production will be around 50,000 tons.

The total expenditure will include yards, docks, cranes, buildings and electrical installations as well as necessary auxiliary equipment.

Plans call for completion of the program by late 1954 or early 1955.

Follansbee Steel formerly produced steel in four open hearths at Toronto, O., but disposed of them and the other equipment there at the end of 1949. That plant is now the Ohio River Steel Corp.

Follansbee Steel also had disposed of hand sheet mills at its Follansbee, W. Va., works, leaving only cold strip mills in operation.

More Power for Ohio Works

A $9 million steam and electric power plant will be built by U. S. Steel Co. at its Ohio works in Youngstown.

Plans include the installation of two steam boilers fired by blast furnace gas which will increase present steam producing capacity eight-fold. Coupled with existing electricity supply will be a 15,000-kilowatt turbogenerator—enough to furnish power for both Ohio works and the nearby McDonald plant.

U. S. Steel recently made extensive blast furnace and open hearth improvements at the Ohio works, boosting steel capacity by 160,000 tons a year and pig iron capacity by 212,000 tons a year.

U.S. Steel Reorganizes

Changing its corporate setup, U.S. Steel hopes to get lower costs and improved production

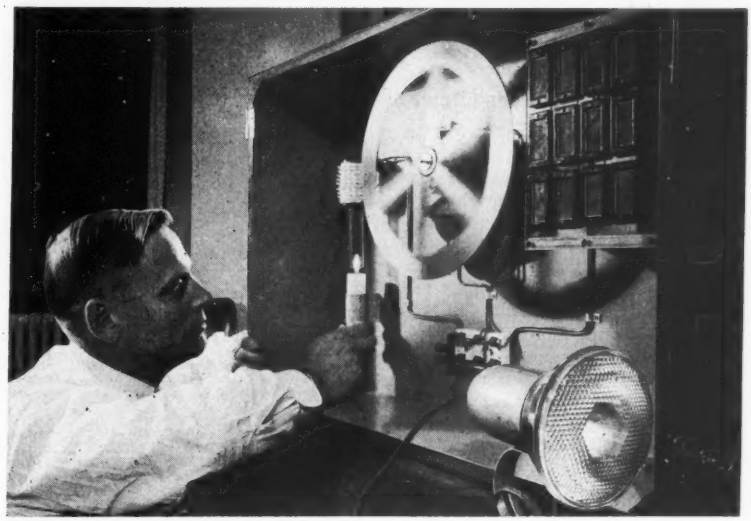
U. S. STEEL Corp. will take a big step in its trend toward becoming an operating corporation on January 1, 1952..

On that date, wholly owned subsidiaries in mining and steel production, fabrication and distribution activities will become general operating divisions of U. S. Steel Co., the major subsidiary of U. S. Steel Corp. involved in the change.

Names Will Change—Names of most of these new operating divisions will correspond with those of the present subsidiaries. Thus, American Steel & Wire Co., will become American Steel & Wire Division; Bradley Transportation Co. will henceforth be Bradley Transportation Division, etc.

Present head of each subsidiary will continue in most instances as president of the new general operating division, with his headquarters remaining in its present location. The reorganization is entirely internal among 100 per cent owned subsidiaries and will affect neither present customer relationships nor change the present stock interests of the stockholders of U. S. Steel Corp.

This effort by U. S. Steel is part of a program to simplify its corporate setup. Begun a year ago, the plan



WORK WANTED: A small device, the Sun Motor, demonstrates that sunlight can be put to work. The light gives enough electric energy to spin the balsa wood wheel on the shaft of a small motor. Unsolved are the problems of efficient conversion of sunlight into power. The Sun Motor is part of General Motors Corp.'s "Previews of Science" shows

is to keep the corporation up-to-date and thereby reduce costs and improve production.

Anaconda Takes Over Kalispell

Anaconda Copper Mining Co., one of the world's biggest producers of the red metal, is entering the aluminum business. It will take over commitments of Harvey Machine Co. Inc. of (Torrance) Calif. to build a plant at Kalispell, Mont., for aluminum ingot product on.

The plant will cost about $46 million and will have an initial capacity of 54,000 tons yearly. Anaconda is forming a new Montana company in which Harvey will have a small interest. Harvey, too, was forming a Montana Co., when its government loan was held up at the request of the Interior Department (STEEL, Sept. 24, p. 68). Anaconda will finance the project without government funds. It is understood, though, that it got a certificate of necessity entitling it to accelerate amortization of building costs.

Anaconda will get its bauxite concentrate from other companies in this country. It is not going to build an aluminum plant nor is it planning to build ore boats as Harvey Machine had intended to.

Rust Gets Ford Slab Contract

Rust Furnace Co., Pittsburgh, received a contract to build a new slab heating furnace for Ford Motor Co.'s Steel Division at its Rouge plant. The new facility will supplement two furnaces now serving the plant's hot strip mill. It will increase the mill's rolled strip capacity to an estimated 300 tons per hour.

Allotment Appeals Turned Down

Denials continue the rule with the NPA Appeals Board in passing on requests for larger allotments of controlled materials. The invariable criterion is whether the shortage of material complained of in each case is hindering the national defense programs.

In latest cases, Louis-Allis Co., Milwaukee, requested more carbon steel, stainless steel, copper and aluminum for manufacture of electric motors; BMC Mfg. Corp., Binghamton, N. Y., asked more steel for children's tractors, autos, racers and wagons; Liebmann Breweries Inc., Brooklyn, N. Y., requested tin plate for beer cans; Elkay Mfg. Co., Chicago, requested permission to use nickel steel in manufacture of sinks; Victory Packing Co., Los Angeles, asked for an over-quota supply of cans for animal and pet food. All were denied.

THE MEN BEHIND THE JETS: A wide-spread group of subcontractors aid in the production of Westinghouse turbojet engines, which involves nearly all the metalworking skills devised for a mass-production economy. These main production aisles are almost a quarter of a mile long at the Westinghouse plant at Kansas City, Mo.

Good Prospect for Subcontractors: Ammunition Parts

COMING up are greater subcontracting opportunities for ammunition parts.

That may be deduced from remarks by Brig. Gen. Merle H. Davis who spoke before a regional meeting of the American Society of Tool Engineers in Evansville, Ind. He points out that the substantial ammunition stocks we had at the start of the Korean War are diminishing and that ammunition is being consumed faster. So, he says, "the time has come for the ammunition industry to really start producing." He cautions that ammunition subcontracting may be a more exacting job now than during World War II because requirements today are more complicated.

Underlining General Davis' remarks, American Cladmetals Co., Carnegie Pa., announces that it will start production of 0.50 caliber bullet jacket cups in 1952. Cladmetals for jet planes, for shielding electronic communication systems from interference and for motor radiators are now being produced by American Cladmetals Co. The cladding of a soft metal, such as copper, on a steel base prevents the rifling in a barrel from being destroyed as the bullet rides through.

Also awarded were contracts for 35 Landing Ships—Utility to four small business firms by the Navy Department. The four firms are Island Dock, Inc., Kingston, N. Y., Reynolds Ship Repair Inc., Buffalo, N. Y., Marietta Mfg. Co., Point Pleasant, W. Va., and Port Houston Iron Works, Houston. The LSUs will be basically the same as the World War II LCTs, though slightly longer.

Other contracts awarded by the government, in excess of $250,000:

Product	Contractor
Broaching Machines	R. K. LeBlond Machine Tool Co., Cincinnati
Boring Machines	R. K. LeBlond Machine Tool Co., Cincinnati
Machinery & Equipment	General Electric Co., Lockland, O.
	Niles-Bement-Pond Co., Chandler Evans Div., Hartford, Conn.
Cranes	Bay City Shovels Inc., Bay City, Mich.
Hoisting & Rotating Units	M. L. Bayard & Co., Philadelphia
Road Graders	Rome Grader Corp., Rome, N. Y.
Crane Equipment	Thew Shovel Co., Lorain, O.
Tools & Equipment for F-84F	Republic Aviation Corp., Farmingdale, L. I., N. Y.
Damper Assemblies	Grumman Aircraft Engineering Corp., Bethpage, L. I., N. Y.
Major Components for Radar Sets	General Electric Co., Syracuse, N. Y.
Repair Parts for Turbines, etc.	Dravo Corp., Philadelphia
Repair Parts for Aircraft	United Aircraft Corp., Chance Vought Aircraft Div., Dallas
Spare Parts for Gun Mounts	Miller Printing Machinery Co., Pittsburgh
Spare Parts for M1 Rifle	International Harvester Co., Evansville, Ind.
Spare Parts for Tractors	Caterpillar Tractor Co., Peoria, Ill.
	R. G. LeTourneau Inc., Peoria, Ill.
Work Tables	State Hardware Co., Philadelphia
Folding Chairs	Richmond Radiator Co., New Castle, Del.
Fuzes	Casco Products Corp., Bridgeport, Conn.
Receiver-Transmitter (6 contracts)	Federal Telephone & Radio Corp., Clifton, N. J.
Radio-Receiver (2 contracts)	Federal Telephone & Radio Corp., Clifton, N. J.
Transmitting Sets	Collins Radio Corp., Cedar Rapids, Iowa
Amplifiers (3 contracts)	Federal Telephone & Radio Corp., Clifton, N. J.
Handsets	Connecticut Telephone & Electric Corp., Meriden, Conn.
Control Groups (3 contracts)	Federal Telephone & Radio Corp., Clifton, N. J.
Control Boxes	Automatic Mfg. Corp., Newark, N. J.
Control Units	Gray Mfg. Co., Hartford, Conn.
Radio Mountings	Federal Telephone & Radio Corp., Clifton, N. J.
Jack Assemblies	Kellogg Switchboard & Supply Co., Chicago
Signal Generators	Measurements Corp., Boonton, N. J.
Radio Tubes	Radio Corp. of America, RCA Victor Div., Harrison, N. J.
	Raytheon Mfg. Co., Power Tube Div., Waltham, Mass.

But Where To Get Them?

Contract tool and die shops need at least 5000 more skilled employees

CONTRACT tool and die shops need at least 5000 more skilled employees. If requirements for captive shops were added, the scarcity would be even worse, delegates heard at the annual meeting of the National Tool & Die Manufacturers Association in St. Louis.

Cold Comfort—More than 300 delegates representing the 500 contract tool and die shops which now make up the association, got cold comfort from Col. Lewis F. Kosch, chief, Manpower Division, Selective Service System. He likened the existing military manpower pool to a joint checking account upon which a number of persons are drawing without keeping each other informed. He advised the tool and die men not to count on holding men under 26.

As moderator of a panel discussion on training for tool, die and machine shop occupations, DeForrest Pratt, director of training, Cincinnati Milling Machine Co., emphasized that such training is a long-term job which must be budgeted accordingly.

New officers of NTDMA for 1951-52 who were introduced at the closing session of the St. Louis meeting are: President, Randolph H. Cope, who is vice president and manager of Bunell Machine & Tool Co., Cleveland. First vice president, Alfred Reinke, who is president of Gus Reinke Machinery & Tool Co., Hillside, N. J. Second vice president, Herbert C. Murrer, who is president of Murrer Tool Co., Cincinnati. Treasurer, Herbert Harig, who is vice president and treasurer of Harig Mfg. Co., Chicago. Secretary, Joseph N. Huser, who is president of B & H Specialty Co., Indianapolis. George S. Eaton was re-appointed executive secretary with headquarters at 906 Public Square Bldg., Cleveland.

RANDOLPH H. COPE
. . . newly elected president of NTDMA

Toolbuilders Told To Prospect for Subcontractors

"EVERY MACHINE tool company today should go prospecting for subcontractors."

So says Richard E. LeBlond, president of R. K. LeBlond Machine Tool Co. and retiring president of the National Machine Tool Builders' Association, who spoke at the group's 50th annual meeting in Hot Springs, Va., last week.

The Start—The place to start, he thinks, is among the builder's own customers, where the people and equipment are known. He believes that subcontracting is the quickest and most practical means of boosting machine tool production.

Mr. LeBlond told his fellow machine tool builders that they have nothing to fear on the score that many subcontractors may elect to stay in the machine tool business and compete in an industry which during peaceful times already has plenty of competition. He reported: "All the subcontractors I have talked to wonder how we can possibly sell machine tools at the prices we do and make a profit."

Foreign Tools—Kermit T. Kuck, vice president, Monarch Machine Tool Co., reported on foreign tools. His observations were based partly on his visit to the International Machine Tool Show in Paris in September.

Mr. Kuck believes that the European machine tool is a quality product, usually well engineered, which will give strong competition on world markets to American machines when and if normal trade patterns return.

FREDERICK S. BLACKALL
. . . newly elected president of NMTBA

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

ALUMINUM—NPA Order M-88, effective Nov. 1, 1951, is to aid distributors and warehouses in replacing their stocks of aluminum. Distributors are authorized to order in each month the same quantity of each form and shape of aluminum which they delivered during the preceding month.

STEEL—Amendment of Nov. 1, 1951, of Direction 3 of NPA Order M-1 permits steel companies to sell 100 per cent of their output on a pick-and-choose basis, in all but the last 15 days of lead times. If their order books are not filled by the last 15 days, they must accept in those 15 days all authorized controlled materials orders offered them until their order books are full.

COPPER—Amendment of Nov. 2, 1951, of Direction 2 to NPA Order M-11 allows copper producers to sell 100 per cent of their output on a pick-and-choose basis in all but the last 15 days of lead times. If their order books are not filled by the last 15 days, they must accept in those 15 days all authorized controlled materials orders offered them until their order books are full. Notice of acceptance or rejection of orders must be given promptly. Order books for a calendar quarter must be opened not later than 90 days prior the first day of the quarter.

NPA Regulation

TRANSFER OF QUOTAS—NPA Regulation 6, effective Nov. 5, 1951, spells out conditions under which a company's priority ratings, materials quotas and other authorizations granted it by NPA may be transferred, along with its other assets and obligations, when it is sold as a going concern to a new owner.

Price Regulation

BROWN IRON ORE—Revision 1 of Supplementary Regulation 41 of the General Ceiling Price Regulation raises price ceilings 2 cents a long dry unit (22.4 pounds) on brown iron ore produced in Alabama, Florida, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and Virginia. This increase is equivalent to one granted last July to brown iron ore producers in Georgia.

Windows of Washington

By E. C. KREUTZBERG Washington Editor

Army seeks to stop buckpassing, tells brass: "Don't Equivocate." Harriman has free rein on spending $7.3 billion. National Science Foundation scaled down

THE ARMY is making a strong attempt to wipe out the old Army institution of "pass-the-buck."

It's telling junior officers and civilian assistants to make positive recommendations when reporting findings from assigned studies. Normal tendency is to pussyfoot when reporting to the boss. That's the thing the Army seeks to checkmate. It is striving toward this objective by saddling responsibility not only on top brass but on their subordinates. How the system is supposed to work is indicated by the following instructions to follow upon the assignment of a problem:

1. Work out all details completely.
2. Consult other staff officers.
3. Study, write, restudy, rewrite.
4. Advise the chief what to do. DON'T ASK HIM!
5. Prepare a single, coordinated, proposed action. DO NOT EQUIVOCATE!
6. Do not present long explanations or memoranda. Correct solutions are usually recognizable.

"If you were the chief, would you sign the paper you have prepared, and thus stake your professional reputation on its being right? If not, take it back and work it over; it is not yet completed staff work."

New Santa Claus . . .

After serving the administration in a number of important capacities, W. Averill Harriman has attained the glamor-boy status last enjoyed by Paul Hoffman during the years the latter headed the fabulous Economic Cooperation Administration. As the Director for Mutual Security Mr. Harriman will direct the spending of the $7.3 billion appropriated by Congress for fiscal 1952 for mutual security purposes "without any further action by the President, and the funds may be allocated by the Director for Mutual Security to any agency, establishment, department or wholly-owned corporation of the government" etc.

Under an executive order, he has an equal voice with the secretary of state and the secretary of defense in determining the economic and military assistance policies under which this money will be spent. Up to $2 billion of the total will be spent in foreign countries —making him the world's No. 1 Santa Claus. In the alphabetical language of Washington ECA no longer will have a place after Dec. 31. On Jan. 1 the old Economic Cooperation Administration will be replaced by the new and far more comprehensive Mutual Security Agency.

Research Limited . . .

Because Congress appropriated only $3.5 million of the $14 million requested, the National Science Foundation had to scale down its program for the initial year of its existence. Two groups of expenditures are of special interest to industry—$1,350,000 for training of scientific manpower, and $1,500,000 for basic research in biology, medicine, mathematics, physical sciences and engineering.

Basic scientific research support is to take the form largely of research grants; no such grants yet have been made but several are under consideration. Grants of interest to the metals industries come under Dr. Paul Klopsteg, head of the Division of Mathematical, Physical and Engineering Sciences. The National Science Foundation has established permanent headquarters at 2144 California St. N. W., Washington.

WHICH ARE YOU?

NPA OFFICIALS are accustomed to dealing with tough-minded industrialists who bring powerful pressures to bear for more steel, copper and aluminum than they are able to get under the Controlled Materials Plan.

The Agency was stopped cold a few days ago in dealing with a spokesman for the toy train industry. More steel, he said, is needed by that industry than it is getting. "It simply boils down to this," he told the NPA men. "Either you are for the kids in this country, or you are against them."

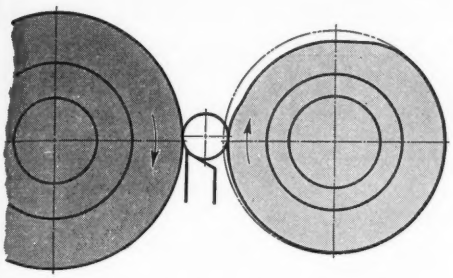
Boom in Boron . . .

Boron-treated low-alloy and carbon steels as substitutes for higher-alloy steels are taking hold nicely, informed NPA officials say. Output in November will be about 37,000 tons, compared with 35,000 in October. A good many consumers have learned how to use them, and expect to continue specifying them as long as the alloy shortage lasts. Other consumers have test programs under way.

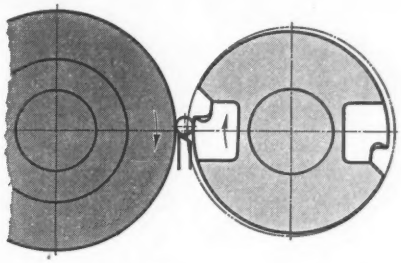
The most popular use of boron-treated steels involves the lean low-nickel-chromium-molybdenum specification 94B17. About 7500 tons of this steel, boron-treated, is being used monthly for production of carburized gears.

Pain in the Pocketbook . . .

One salutary act of the 82nd Congress at its first session was elimination of the "tax-free" label on the expense money paid to congressmen and top government officials—$50,000 to the President, $10,000 each to Vice President Barkley and Speaker Sam Rayburn, and $2500 to each representative and senator. On the one hand congressmen talked of promoting ethics in government and investigated minor government employees accused of accepting improper payments or other rewards for favors granted. On the other hand they were setting the bad example of exempting themselves from taxes paid by the run of citizens.



Cammed regulating wheel. Work is loaded and ejected at low section of wheel. Production per minute = rpm of regulating wheel.



Double cammed regulating wheel, notched for loading and ejecting the work. Production per minute = 2 x rpm of regulating wheel.

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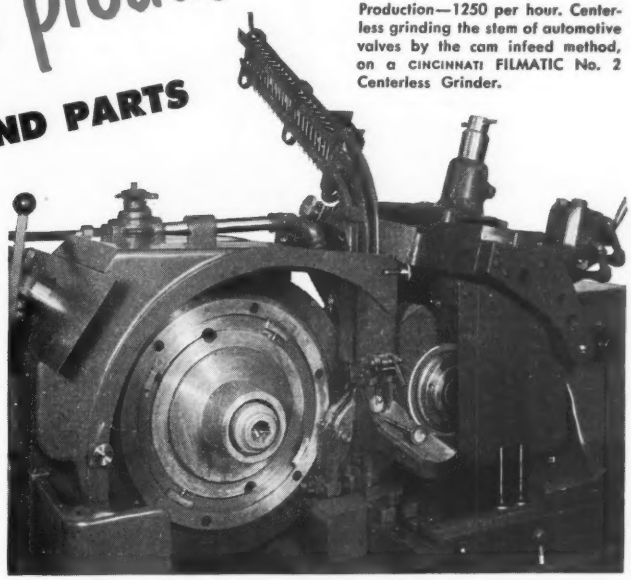

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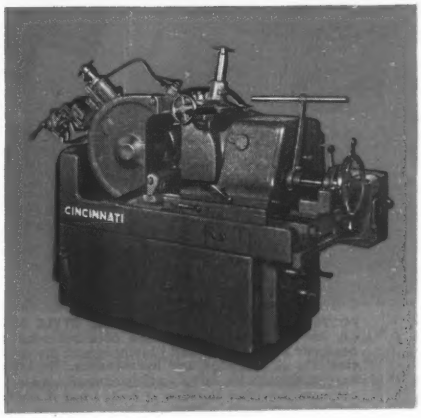
CINCINNATI FILMATIC No. 2 Centerless Grinding Machine. Complete specifications may be obtained by writing for catalog No. G-591.



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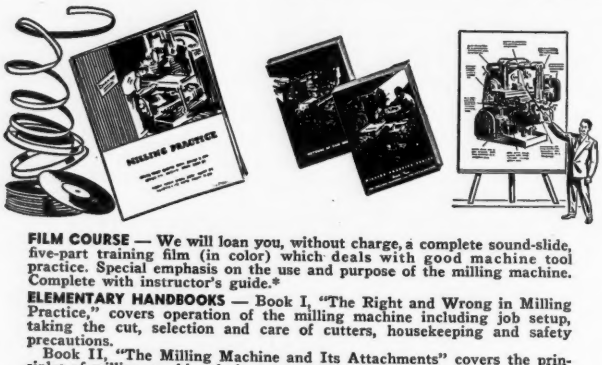

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MACHINE TOOLS

U.S. Hit by Ruhr Scrap Drive Failure

American consumers had high hopes for several thousand tons of German scrap a month, but a Ruhr campaign to dig up the material was largely a flop

A GERMAN iron and steel scrap drive has failed, and American buyers are left high and dry.

U. S. users had been hoping for several thousand tons of the material a month; now it looks as if they'll be lucky to get any.

The Background—High hopes for the success of the drive were based on the fact that the West German government promised to go to extraordinary lengths to assure its favorable outcome. The republic's officials were co-operating because they wished to prove they were wholeheartedly committed to the free nation's push for greater industrial production. The Bonn government and the Scrap Dealers Association spent nearly $225,000 to publicize and further the scrap campaign. They both also wanted to deliver on a scrap trade agreement signed in September.

Under terms of that pact, the first 325,000 metric tons of the monthly collection would be reserved for German home consumption. The next 50,000 tons would be exported—60 per cent to the U. S. and Great Britain and the remaining 40 per cent to other countries, mainly Sweden. For all monthly collections over 375,000 tons, half would go to Germany, half to foreign buyers. In the first month of the scrap drive, just 327,000 tons were collected, leaving only 2000 tons for export in November. The U. S. share in that will be less than 1000 tons.

Keystone—West Germany is crucial to the whole Western European scrap situation because it's the only nation that has, or was thought to have, substantial surplus supplies. If the country could have delivered 50,000 tons a month for export, the U. S. would have received some 15,000 tons every 30 days, a godsend in these times. The scrap campaign will continue in the Ruhr, but now not much can be expected of it.

Scrap dealers in West Germany and other European nations claim that more material could be pried loose if ceiling prices are removed, or at least relaxed. Ceilings on German scrap average $21 per metric ton; they're $24 on foundry grades. Gray and black market prices are from two to three times the legal quotations. The highest offers are coming from Belgian buyers. An estimated 20 per cent of all scrap now sold in Western Europe is moving on the black market.

Germans Await Ramifications

West Germans are braced for serious ramifications of their failure to raise much iron and steel scrap for export.

Aside from raising the ire of Great Britain and the U. S., the defection may cost them Swedish and Austrian iron ore. Under terms of a trade agreement with Sweden, that nation is supposed to get 100,000 tons of German scrap. The Germans are already 40,000 tons behind in their deliveries, and the Swedes may retaliate by curtailing ore shipments. Austrians may do the same thing. In August and September, the Ruhr imported 1.1 million net tons a month, about double average monthly shipments earlier in the year.

But there's still not enough ore—and scrap—for domestic use, and steel production has slipped lately. Iron and steel will be allocated soon to the 60,000 consumers in the country. About 15 per cent of German steel output is going into the black market. Recognizing that legal prices are too low, Bonn permitted the steel industry to raise them, effective Nov. 1, an average of $8.44 per metric ton.

Hardest hit by the steel shortage are shipbuilders who can't begin to get all the 42,000 tons they need monthly.

Scrap Drive More Successful

The British have greater success with their scrap drive than have the Germans.

Enough of the material has been recovered in the United Kingdom to forestall extensive shutdowns, but the situation is still nip and tuck. The nation's steel production target of 17,920,000 net tons this year won't be achieved because of the lack of scrap—and coke. A bill for denationalization of the British steel industry will go before the House of Commons in February, Winston Churchill promises.

French Steel: More and Better

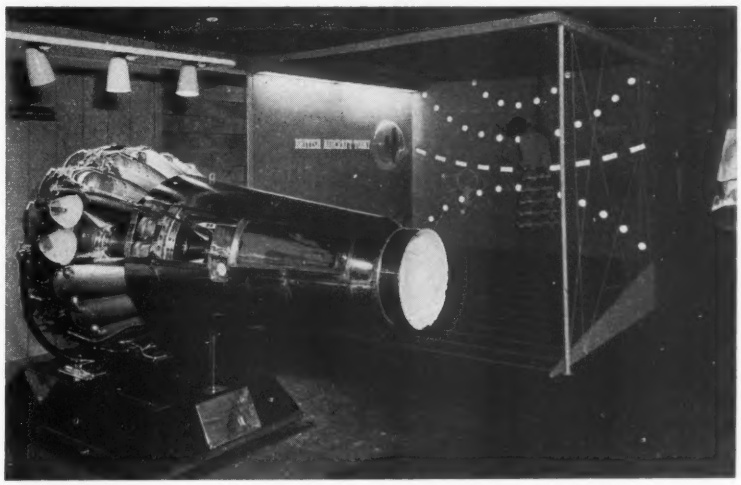
A German economic institute in Essen estimates that French steel ingot capacity will rise from the present 11-million-ton potential to 13,250,000 tons by 1953.

Finishing facilities will be expanded even more spectacularly. Sheet capacity will be doubled and the tin plate capacity tripled. The French steel plant has long been top heavy with basic capacity, but now that fault will be remedied.

U.K.-U.S. Steel Swap Possible

American steel ingots may be exchanged for British structural steel, Defense Production Administrator Manly Fleischmann says.

The tonnages to be swapped are still subject to negotiation. Britain has plenty of structural steel but not enough ingots. American ingot supplies are far more adequate than are those of structural steel.



RAMBLING ROLLS: This Rolls Royce "Goblin" gas turbine airplane engine is part of the Land Traveling Exhibition of the Festival of Britain. The traveling exhibition will visit Leeds, Manchaster, Birmingham and Nottingham, England

No Holiday for Salesmen

They are selling, but they're also pacifying, expediting and acting as consultants

THIS MAY COME as a surprise to at least one government official who wondered what use industry could make of salesmen during an allout production period. Salesmen are being put to good use these days.

In a spot survey made by STEEL among a variety of metalworking activities not one company revealed that it was cutting down on its sales force. Few were failing to replace men who left for military service or resigned.

"By and large," says L. M. Clegg of Thompson Products, Inc., "salesmen are doing the same things they have been doing, but they are having greater problems because of the necessity of working under a part-war, part-peace economy."

Says an aircraft accessories executive: "We have increased our sales force since Korea; we want three more sales engineers."

An automotive accessories executive: "Our men may not be doing missionary sales work, but they call on our customers regularly. They're always working on inquiries. But they also help us schedule production so the neediest customers get attention first."

An electric controls manufacturer: "Our salesmen are doing service work. That's something they've always had to do. But they are also gathering information so that orders can be processed more quickly."

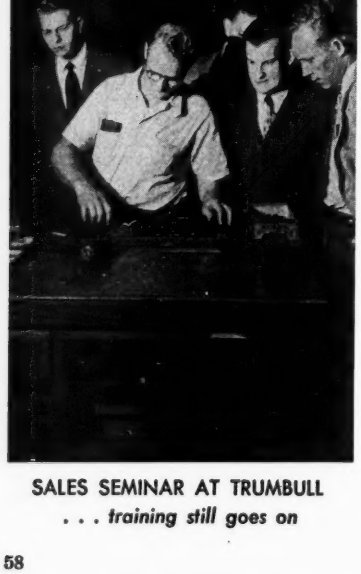
Faced with the prospect of not being able to satisfy civilian-business customers, more than one sales manager believes the primary job of their salesmen is to pacify customers.

Other companies, closer to civilian end products, are still actively training salesmen. Trumbull Electric Department of General Electric Co. held a marketing seminar last month for 15 new salesmen trainees.

Call of Duty—Salesmen for many metalworking facilities are doing jobs — in addition to their regular sales chores—that are scarcely allied to the sales cause: 8000 steel salesmen are working with local scrap mobilization committees to help build up the nation's dwindling scrap pile. Other salesmen are helping customers or employers get government contracts. Warner & Swasey Co. is utilizing its salesmen as consultants for customers to whom it cannot make immediate or near-term deliveries. Salesmen are teaching customers to use their present equipment more efficiently.

Beyond the Call—Other "odd jobs" for salesmen: Studying government regulations to determine distribution, prices and other controls, chasing down materials, advising customers on metallurgical and other technical problems. Steel warehouse salesmen in particular are helping customers get the best use of straight chromium steels.

Says one executive: "A great many salesmen are doing things today that are above and beyond the call of duty."



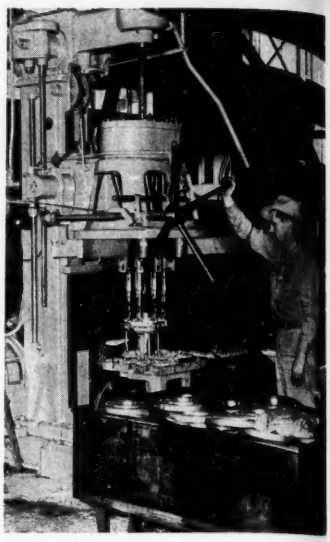
SALES SEMINAR AT TRUMBULL
. . . training still goes on

Wanted: Uranium Prospectors

Interested in prospecting for uranium? Atomic Energy Commission believes that the job can be done by private industry and private individuals.

The government-guaranteed ore price is high and discovery rights are about the same as apply to other mineral deposits. If you're interested, AEC recommends you write for its guide and handbook, *Prospecting for Uranium*. It contains descriptions of uranium minerals, tells where to look and how to test for uranium, where to buy and how to use a geiger counter and gives a summary of mining laws and a list of laboratories where samples are assayed free.

If you're going out on your own as a prospector, AEC recommends: First familiarize yourself with known occurrences of uranium, both through visits to areas of uranium mineralization and through published literature; include a geiger counter in your equipment; examine mine mineral collections, specimen cases of nearby museums, mine tailing piles and ore and mine working for radioactivity as one way to practice using the geiger counter. When you have laid the preliminary groundwork, AEC recommends that you call upon geologists of the commission and the U. S. Geological Survey for advice and assistance.



WAY OUT WEST: Formed in 1948, Lyco Machine Works, Oakland, Calif., now has several million dollars in contracts on hand and in process. This multiple drill, one of 134 pieces of major equipment being installed, will make Lyco one of the big industrial machine plants on the West Coast. Employment, now 70, will be five times that number when all the machinery is in place by January 1

Big Market for Fission Products

A big potential demand for fission products exists in industry, but many technical and economic problems must be solved before new uses for those by-products of the atomic energy program can develop.

That was the conclusion of Stanford Research Institute from a survey of industrial uses of radioactive fission products. Millions of curies of radioactivity are contained in the process wastes left over from the production of plutonium in the AEC's nuclear reactors. Of no usefulness for industrial or explosive power or as a heat source, those fission products are known to be a potential source of large quantities of low-cost radiation. Refinements and concentration of the

products, now stored at Atomic Energy Commission installations, will undoubtedly be necessary to make them suitable for industry, the SRI study indicates.

Present commercially feasible industrial uses include the activation of phosphors for self-luminescent signs and markers, static eliminators for many industrial processes, the reduction of starting voltage requirements in fluorescent light tubes and in process control instruments. Possible future uses for fission products include industrial radiography and portable power sources.

Synthetic Gas Costs Weighed

Production of synthetic fuels from coal by the hydrogenation process is uneconomical, according to a study by the National Petroleum Council's Synthetic Liquid Fuels Production Costs Committee.

The committee reports that while the cost of synthetic liquid fuels from oil shale was "significantly higher" than the cost of gasoline produced from crude petroleum, that method "warrants continued attention" of the petroleum industry.

On the basis of operating plants with a total capacity of 216,000 barrels per day, the cost—not including the cost of distributing, marketing or sales tax—of producing a gallon of synthetic gasoline from coal hydrogenation would be 43.5 cents. On the same basis, a gallon of gasoline made from oil shale would cost 14.7 cents delivered to a major consuming area. The present wholesale price at the refinery of gasoline produced from crude oil varies from 12 to 13 cents a gallon, excluding tax.

Solar Licenses Coating Process

Solar Aircraft Co., San Diego, Calif., and Ferro Corp., Cleveland, have joined forces to help save on high-alloy steels.

The Cleveland firm, producer of raw materials and furnaces for the porcelain enameling industry, has been given exclusive license to manufacture, market and service high-temperature ceramic coatings developed by Solar that enable low-carbon steels to last as long and perform just as efficiently as the high-alloy metals.

Originally developed to protect jet engine parts, the coatings are also expected to be useful when applied to equipment for petroleum fractionating processes, to bearing surface on motors working under high-temperature conditions, in industrial furnaces and in home heating equipment.

The Gap in Arc Welding

The question for its equipment makers is: Where to get the steel they need

IN DEFENSE PRODUCTION which comes first, the chicken or the egg?

As electric arc welding equipment makers put it, which is more important in making war equipment, a prime means of fabricating, such as arc welding, or increased materials to use in the fabrication? The arc welding equipment makers have an answer, but so far, they haven't found the government ready to listen to it.

They say it's first necessary to provide a means to fabricate the material you have before trying to get more. Yet, arc welding equipment makers are going wanting for more steel.

Could Do Better—Currently, the demand of fabricators for arc welding equipment far outstrips supply—deliveries being extended from 90 days to nine months.

But, the arc welding equipment manufacturers say they can increase their production by 30 to 50 per cent. Welding rod makers, for example, are turning out about 40 million pounds of rod per month; the high water mark during World War II was 100 million pounds per month.

Even though the arc welding machine makers could produce more, business is better this year than last. Sales in units for 1951 are running about 10 per cent higher than 1950, and dollar sales are up about 15 per cent. The 1950 arc welding sales totaled $87 million—$27 million for machines, $49 million for electrodes, and $11 million for accessories.

Of each welding dollar spent in the U. S., arc welding accounts for 22 cents, gas welding, 72 cents, and resistance welding, 6 cents. This 22 cents of arc welding equipment buys 6.8 cents worth of machines, 12.5 cents worth of electrodes, and 2.7 cents worth of accessories. Defense and defense supporting work takes 75 per cent of the output.

Within the Industry — While there are 65 companies in the arc welding machine field, six or eight produce all of the motor generator sets and most of the transformer sets. Adapted for mass-production methods, transformer type welders now require advertising and merchandising to insure steady sales. One typical small company which formerly made arc welding outfits left the field in preference for resistance welding equipment because its smaller staff was better equipped to sell the more specialized tailor-made resistance welding applications. A 300 ampere motor generator type arc welding machine costs $500 and a 500 ampere transformer type set costs $550.

Most companies are running on one shift, but believe that they could easily find manpower for two or three shifts if they had the materials with which to work.

STRETCHING 30 INCHES OVER 791 MILES: Completion of this 30 inch pipe line will increase by 400 million cubic feet of gas per day the carrying capacity of the Texas Eastern Transmission Corp. system. A side-boom tractor pulls a cleaning and priming machine up a steep Tennessee Hill during construction of the line between Kosciusko, Mississippi, and Connelsville, Pa.—a distance of 791 miles

From Bumper to Tailgate . . .

N-A-X HIGH-TENSILE STEEL

Reduces Deadweight and Increases Durability

The widespread use of N-A-X HIGH-TENSILE steel in transportation equipment emphasizes two vital characteristics of this high-strength low-alloy steel.

1. *Strength with less deadweight.* N-A-X HIGH-TENSILE steel reduces deadweight . . . of great importance in transportation equipment and military vehicles.
2. *Exceptional durability.* N-A-X HIGH-TENSILE steel, with its high strength and toughness, has proved greater resistance to fatigue and impact at normal and sub-zero temperatures. Its inherent structure and composition greatly reduce the effects of abrasion and corrosion.

The response of N-A-X HIGH-TENSILE steel to severe cold-forming operations and its excellent weldability by electric arc or resistance, atomic hydrogen or heliarc, and all other processes, are added important characteristics of N-A-X HIGH-TENSILE steel.

The "Eager Beaver"

The use of low-alloy, high-strength steels in military equipment assures longer life with less deadweight.

GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division • Ecorse, Detroit 29, Michigan

NATIONAL STEEL CORPORATION

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

A Detroit defense contracting clinic gets a big attendance and many exhibits, but the consensus among exhibitors and visitors is that the affair didn't help much

DETROIT

BY A SUPERFICIAL criterion the prime contractors' exhibit for subcontractors here recently was a bang-up success.

Registration was 6156 and many of those came several times during the four-day show. That topped the number who have visited small business clinics in several other cities by a substantial margin. Sixty companies and government procurement and information agencies had set up booths and their representatives did a lively business talking to manufacturers about subcontracting opportunities in defense production. A casual observer would get the impression that clinics like these will solve most of the procurement problems of defense contractors.

Grass Roots Opinion—But here are quotations from exhibitors: "We need more production than the people who came here can give us." "These affairs don't help us find out anything, we know everybody who could make this item." "It wouldn't look right if we didn't have a booth, but we're not doing any good here." "Too many of these fellows don't know what they can make." "Some of them want us to buy the machinery for them." "I try to be polite, but he says: 'I make Venetian blinds, what can I make for you?'" "I find out what machines he has and have to figure out myself what he can do."

And some of the visitors said: "Only the hard-to-make parts are left." "They took my name and said they'd put me on file." "I'm disappointed with it but I found out who to contact in some purchasing departments." "I saw a couple parts that I was turned down on because my bid was too high." "There isn't anybody here that I haven't already called on."

Not All Gripes—Not all the people at the clinic were unhappy. It depended on what they were expecting. A few of the exhibitors who have put on displays in other cities said they have stopped putting up boards with parts on them. They now use the clinics as a first contact point, a place where they can get fundamental information on an unknown manufacturer and can tell him who to contact in their organization. The automakers, especially, used this tack.

At Ford, Packard and Hudson booths questionnaire forms were available, asking generally for the firm name, peacetime products, facilities and type of defense work the company is qualified to handle. Visitors to Chrysler's booth registered, were given a briefing by purchasing agents on how to do business with the corporation and handed a booklet explaining its subcontracting policies. General Motors also used the briefing technique and passed out its "Selling to GM" booklet which contains a directory of its manufacturing divisions and their peace and war products.

Useful Approach—Many companies still find exhibit of actual parts or blueprints useful. Willys-Overland, the Detroit Arsenal, three GM divisions, Wright Aeronautical, Packard and Hudson used that approach.

The clinics are no substitute, many exhibitors felt, for alert selling in the conventional way by manufacturers who want defense business. One Air Force procurement officer, however, pointed out that the Cleveland subcontracting clinic had apparently helped find makers of certain bottleneck parts because tight spots in that area were reduced noticeably about two months later.

Little Change in Chrysler Units

Last January, Chrysler Corp. made the year's biggest automotive splash by its announcement of a new engine, power steering, redesigned bodies, improved shock absorbers, etc. Its press preview

BUT TRY TO GET ONE: Seated at the wheel of Buick Motor Division's dream convertible, the XP-300, is C. E. Wilson, General Motors Corp. president. Buick will not put the dream car into production because of the materials situation. Aluminum, bronze and copper were used generously to provide the car with advanced features

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of those features was a festive affair. Last Thursday it duplicated the party to show 1952 models, but this time things were different.

The new cars are almost indistinguishable from present design. The preview was notable not for them but for the corporation's defense work. And the olive drab and shiny aluminum of its military products symbolized the change in character of motordom — 1952 model.

Missing were some of the company's highly restricted military projects. But security regulations permitted display of three types of military trucks now coming off Dodge Division assembly lines; a 65-foot assembly of major hull sections of the Grumman Albatross, now being built at the Plymouth Evansville, Ind., plant; a tank exhibit depicting the product of the Newark, Del., plant now under construction; the J-48 engine to be built in the Navy-owned, Dodge-operated plant being built north of Detroit; the tank engine to be produced by Chrysler Division near New Orleans; picture of the giant Douglas Globemaster with the major tail and wing assemblies, to be built by Plymouth Division in a nearly completed addition to its Los Angeles plant; and a Hamilton Standard 16½-foot aircraft propellor, the newest defense contract received by the corporation. The Dodge plant at San Leandro, Calif., is being expanded by 750,000 square feet for its production. Additionally, military and civilian products of Airtemp, Amplex, Cycleweld, Chrysler Motors Parts, and Marine & Industrial Engine Divisions and Pekin Wood Products Co. were on display.

Effect of military preparation on materials, tooling and engineering personnel available for civilian production was obvious in the company's new cars. Two models of Dodge and one of DeSoto are among the missing this year—the Dodge Wayfarer Sportabout and Coronet eight-passenger sedan, and the DeSoto nine-passenger Suburban. About the only exterior change evident in the DeSoto is that block letters replace a joined script to spell out the name on the hood. Stop and back-up lights are combined in a new assembly. Interiors of the DeSoto have been dressed up, nylon being used for upholstery.

Exteriorwise, the 1952 Dodge grille has undergone a contraction of bright work; missing is the stainless steel stone shield on the rear fenders, tail light has been redesigned, as have the wheel covers and hub caps. Interior changes include new upholstery design, a combination of rayon and cotton being used in Coronet models for greater durability and comfort.

Neither car is being introduced with a V-8 engine although it is believed likely that small versions of the Chrysler Firepower engine will be incorporated in mid-1952 models.

Chrysler's financial report made the same kind of unhappy reading that General Motors' did (STEEL, Nov. 5, p.80). Strike-bound for more than a quarter in 1950, it is not surprising that this year's three-quarter sales are substantially higher, amounting to $1985 million to Oct. 1 this year, against $1490 million in the comparable 1950 period, and that it has sold 1,117,246 vehicles in three quarters of this year against 898,170 in the like 1950 period. The shock comes in the net incomes of the two nine-month periods. This year's earnings are less than half of 1950's —$50.1 million against $105.2 million. Earnings as a percentage of sales were 2.52 as compared with 7.06 during the first nine months of 1950.

Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,879
February	658,918	505,593
March	802,737	610,680
April	680,281	585,705
May	695,898	732,161
June	653,682	897,853
Six Mos.	4,137,204	3,941,878
July	522,858	746,801
August	571,442	842,335
September	505,758	760,847
October	535,000*	796,010
November	.....	833,784
December	.....	671,622

Week Ended	1951	1950
Oct. 13	120,543	174,234
Oct. 20	120,810	188,323
Oct. 27	121,215	188,230
Nov. 3	119,247	177,122
Nov. 10	121,000*	161,113

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Hectic Meeting with NPA

As everyone knew it would be, the meeting of automakers with NPA to have second quarter 1952 passenger car quotas assigned was an angry one.

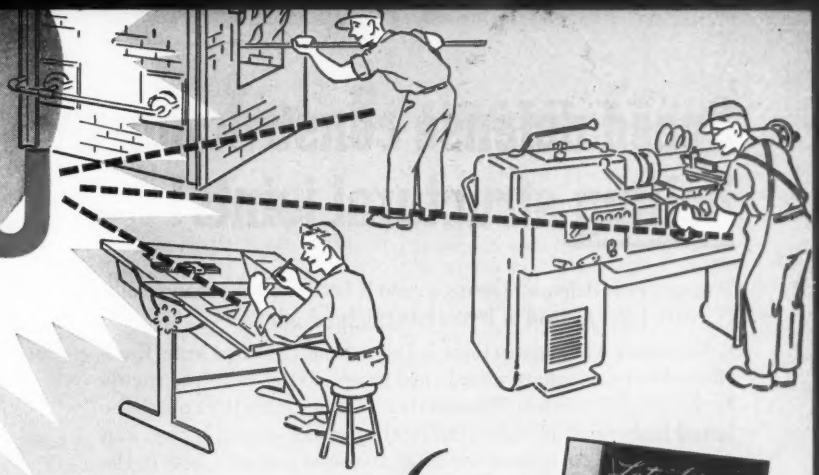
The larger companies, particularly, wanted no change in the percentage-of-industry figures as they presently stand, although some of the small companies had publicly stated that they had NPA assurance of an increase in their assigned precentage when they wanted it. Outcome was that three companies —all makers of a less than conventional size car—got an additional 1.28 per cent of the industry's second quarter quota. Kaiser-Frazer was most favored, having its "take" upped from 1.55 to 2.47, Nash will get 3.45 per cent instead of 3.3 as presently, and Willys-Overland, now authorized to make 1 per cent of industry output, can go to 1.21. Every other maker took a cut, Ford, of the big three, getting knocked down furthest percentagewise.

Labor Troubles Still Threaten

With the Borg-Warner strike now in "recess" while the dispute is before the wage stabilization board and the Electric Auto-Lite walkout over, the potentially most dangerous labor disturbance, automotive-wise, is that of 406 Briggs Mfg. Co. body designers and engineers. All production will halt at Briggs' Outer Drive and Vernor plants in Detroit if only those 406 go out. At this writing picketing had not started.

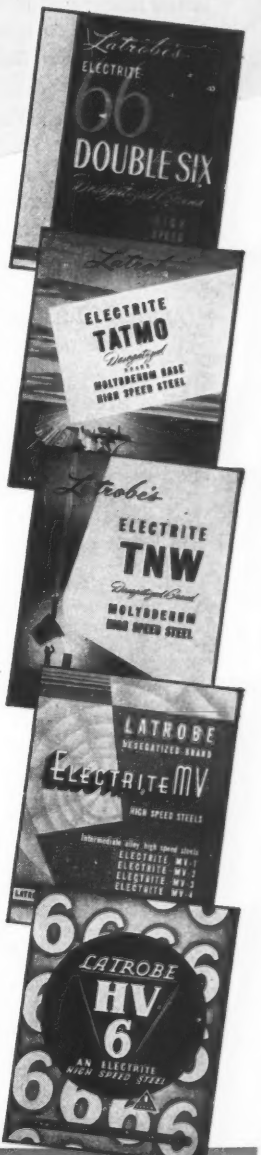
Their UAW contract runs until August, 1955, and incorporates such provisions as the annual improvements factor, escalator clause, etc. Their present demands, generally, are concerned with the merit spread. Within two months from the time of hiring, a new engineer wants to be making only $17.40 a month less than the old employees in his particular classification. Furthermore they want cancelled the overlapping of salary rates between the various classifications. Status quo was prevailing last week with no discussions slated.

have YOU used these



LATROBE DESEGATIZED* BRAND
MOLYBDENUM
HIGH SPEED STEELS

*Trade Mark Reg. U. S. Pat. Office.



The foremost problem facing the metalworking industry today stems from the critical shortages that exist in many raw materials.

Sudden shifts from the use of old and familiar to relatively new and unfamiliar materials are sometimes necessary, therefore, to overcome these shortages and still meet the demands created by expanding production trends.

To assist the possible new—and the old—users of its Desegatized Brand molybdenum high speed steels—Electrite Double-Six, Electrite Tatmo, Electrite TNW, Electrite MV Series, and Electrite HV-6—the Latrobe Electric Steel Company has carefully compiled guides to their proper selection and use. These guides, in the form of pamphlets illustrated at the right, are complete and contain up-to-date information on the analyses, forging, hardening, tempering, testing, recommended uses and the available forms of each of these steels. Get in touch with your nearest Latrobe representative for copies or write direct to the main office in Latrobe, Pennsylvania.

And remember . . . . Latrobe's Desegatized Brand molybdenum high speed steels are fully uniform and free from harmful carbide segregates. This quality—found in all Desegatized Brand steels—guarantees greater tool and die efficiency—an important factor in your production program today!

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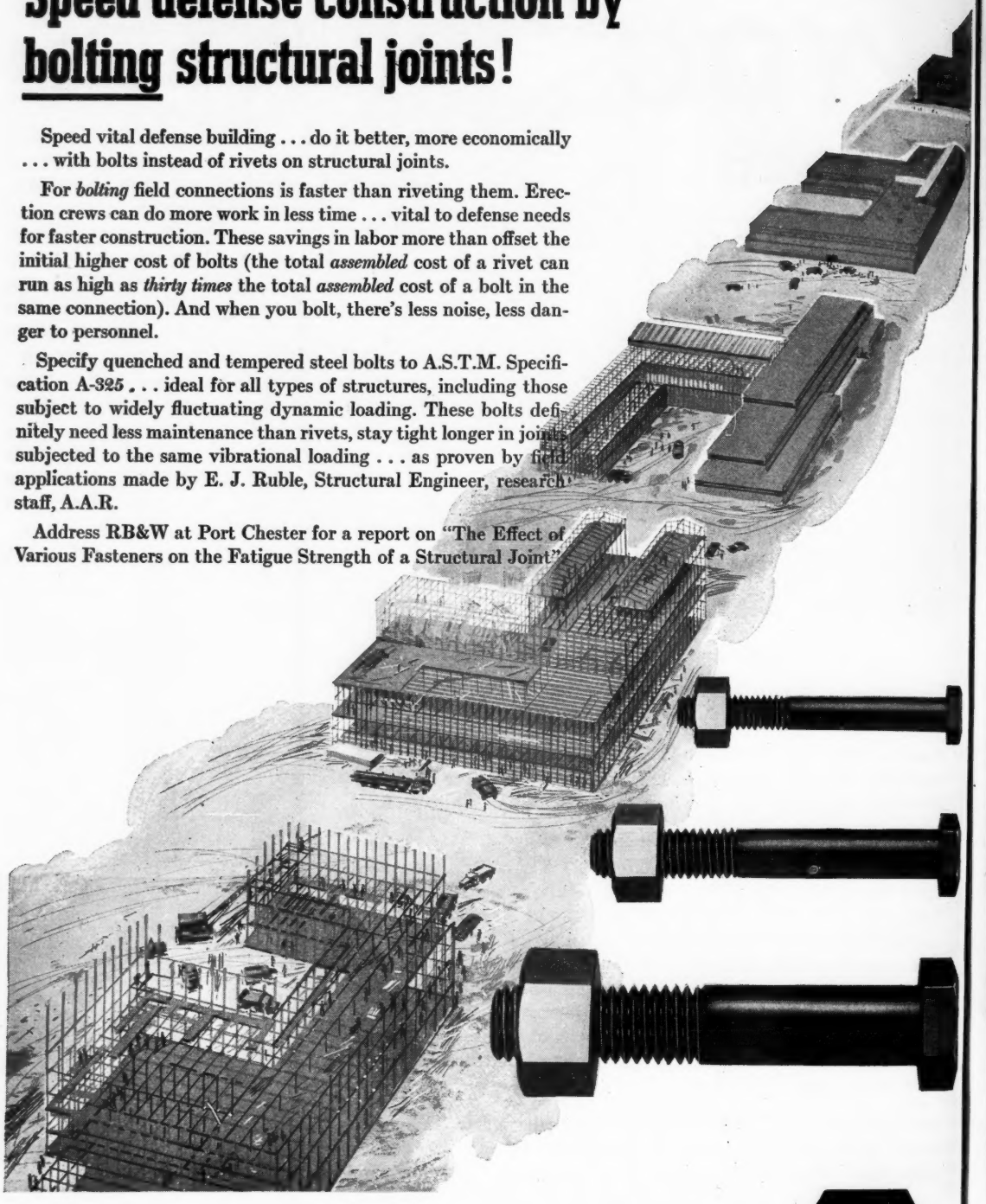
Speed defense construction by bolting structural joints!

Speed vital defense building . . . do it better, more economically . . . with bolts instead of rivets on structural joints.

For *bolting* field connections is faster than riveting them. Erection crews can do more work in less time . . . vital to defense needs for faster construction. These savings in labor more than offset the initial higher cost of bolts (the total *assembled* cost of a rivet can run as high as *thirty times* the total *assembled* cost of a bolt in the same connection). And when you bolt, there's less noise, less danger to personnel.

Specify quenched and tempered steel bolts to A.S.T.M. Specification A-325 . . . ideal for all types of structures, including those subject to widely fluctuating dynamic loading. These bolts definitely need less maintenance than rivets, stay tight longer in joints subjected to the same vibrational loading . . . as proven by field applications made by E. J. Ruble, Structural Engineer, research staff, A.A.R.

Address RB&W at Port Chester for a report on "The Effect of Various Fasteners on the Fatigue Strength of a Structural Joint"



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THE COMPLETE QUALITY LINE

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Dallas, Oakland. Sales agents at: Portland, Seattle.

106 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

The Business Trend

Order of the day seems to be prosperity without profit as industry produces more but earns less. High steel rate, electric power output boost activity index

PROFITLESS PROSPERITY might well be the keynote of the pay-as-you-go defense buildup period.

That was the tenor of third-quarter financial reports from nearly every segment of business. Even metalworking companies—pack mules of the armament burden—for the most part had less to show on the balance ledger for their increased efforts. Serious profit declines were seen in most consumer industries; they were squeezed by the rising floor of corporate taxes against a lowered ceiling of production volume.

Retroactivity of the corporate tax is a misleading factor though. It made the profit skid look worse because third-quarter earnings had to absorb tax increases on second-quarter profits too. Most companies will find their fourth-quarter profit picture less grim than the third.

There's no see-saw in production, even though the industrial product-mix has been scrambled by rearmament. Output volume has held fairly steady since late August, with only creeping gains in some weeks. Federal Reserve Board's production index for October will probably inch up only one or two points from September's 219 per cent of the 1935-1939 average. Going into November (week ended Nov. 3) industrial production, measured by STEEL's index at 217 per cent of the 1936-1939 base, was several points above the October average. The rise can be attributed to record steel and electric power output.

Power Peak . . .

Mainstay of the index most of the year has been electric energy production. The last full week in October shattered all output records with a mark of 7234 million kilowatt-hours. It promises to break through that level frequently before the year ends. Newly installed capacity is coming into use now and industrial demands this winter will be tremendous. September power generation figures, the latest available, show the extent of the output rise. In that month 30,275,324,000 kilowatt-hours of energy were produced by electric utilities alone, an increase of 9.1 per cent in one year. Combined utility and industrial production rose 8.1 per cent above September, 1950. Generating capacity of these two in October totaled 88,405,991 kilowatts.

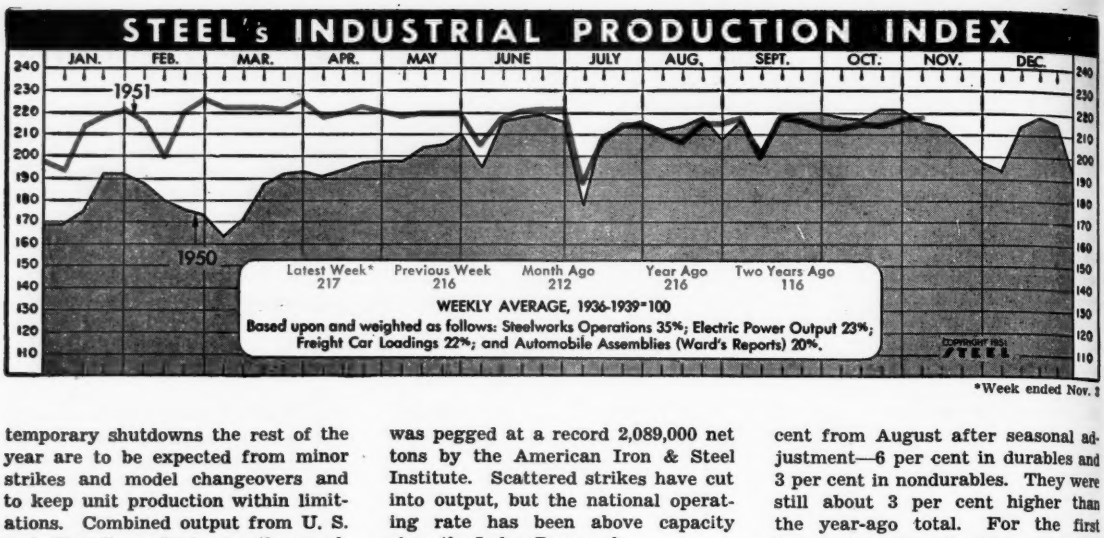
Six Million Cars and Trucks . . .

Last week the 6 millionth U. S.-made vehicle of 1951 rolled off an assembly line of the auto industry. At this time last year about 6.9 million cars and trucks had been produced. Despite limitations, two records will probably be set in the industry this year: Truck completions and Canadian assemblies of both cars and trucks.

Two less working days in November will cause a dip in U. S. production to 363,000 cars and 109,000 trucks, says *Ward's Automotive Reports*. The October count was 409,000 cars and 109,000 trucks. Resolving of supplier strikes makes the industry breathe more easily, but

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	104.0	103.0	101.0	98.5
	Electric Power Distributed (million kilowatt hours)	7,220	7,234	7,156	6,551
	Bituminous Coal Production (daily av.—1000 tons)	1,923	1,896	1,842	1,954
	Petroleum Production (daily av.—1000 bbl)	6,335	6,340	6,338	5,896
	Construction Volume (ENR—Unit $1,000,000)	$209.8	$189.1	$421.9	$199.7
	Automobile and Truck Output (Ward's—number units)	119,247	121,215	112,868	177,122
	*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.				
TRADE	Freight Car Loadings (unit—1000 cars)	870†	864	859	862
	Business Failures (Dun & Bradstreet, number)	143	155	133	181
	Currency in Circulation (in millions of dollars)‡	$28,410	$28,301	$28,320	$27,219
	Department Store Sales (changes from like wk. a yr. ago)‡	+4%	+10%	+3%	+5%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$16,408	$17,004	$17,501	$16,292
	Federal Gross Debt (billions)	$258.3	$258.3	$257.2	$256.8
	Bond Volume, NYSE (millions)	$12.1	$16.2	$15.9	$17.6
	Stocks Sales, NYSE (thousands of shares)	8,142	10,683	10,231	9,223
	Loans and Investments (billions)†	$72.6	$71.5	$71.4	$69.2
	United States Gov't. Obligations Held (millions)†	$31,940	$30,976	$31,212	$33,729
	†Member banks, Federal Reserve System.				
PRICES	STEEL'S Weighted Finished Steel Price Index††	171.92	171.92	171.92	157.76
	STEEL'S Nonferrous Metal Price Index‡	234.9	234.9	234.8	236.9
	All Commodities†	177.0	177.1	177.1	169.7
	Metals and Metal Products†	190.9	190.9	190.9	179.8
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				



*Week ended Nov. 3

temporary shutdowns the rest of the year are to be expected from minor strikes and model changeovers and to keep unit production within limitations. Combined output from U. S. and Canadian plants in the week ended Nov. 3 was 119,247 passenger cars and trucks, off almost 2000 units from the week before.

Slight Letdown in Steel . . .

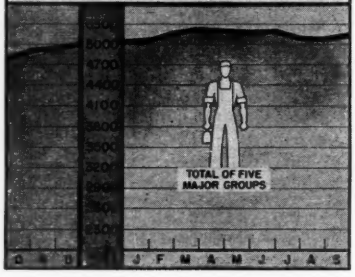
Letting down slightly from its exertions of the week before, the nation's steel mills in the week ended Nov. 10 were scheduled to produce 2,019,000 tons of ingots and casting steels. In the prior week, output was pegged at a record 2,089,000 net tons by the American Iron & Steel Institute. Scattered strikes have cut into output, but the national operating rate has been above capacity since the Labor Day week.

Orders, Shipments Dip . . .

Ordering of production equipment is falling off a bit, according to Office of Business Economics reports. New orders in September dropped 6 per cent to $21.3 billion; durable-goods manufacturers reported larger decrease ($1.1 billion) than nondurable goods makers ($0.4 billion). Shipments were off about 4 per cent from August after seasonal adjustment—6 per cent in durables and 3 per cent in nondurables. They were still about 3 per cent higher than the year-ago total. For the first time in two years backlogs of orders did not increase. Inventory book values continued to rise, due primarily to accumulation of defense goods.

Plant Awards Booming . . .

Industrial construction contracts awarded in the first ten months of this year reached $3635 million, says *Engineering News Record*. That's a jump of 162 per cent over the dollar volume awarded in the same period

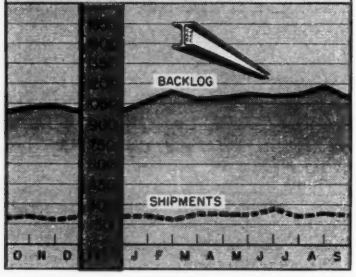


Metalworking Employment

Production Workers—Five Major Groups

1950	Prim. Mtls.	Fab. Prod.	Machinery	Elec. Mch.	Trans. Equip.
Sept.	1,105	837	1,050	673	1,134
Oct.	1,117	850	1,104	710	1,157
Nov.	1,125	849	1,133	720	1,128
Dec.	1,142	852	1,163	724	1,160
1951					
Jan.	1,149	847	1,192	711	1,175
Feb.	1,153	853	1,219	716	1,228
Mar.	1,158	858	1,228	724	1,259
Apr.	1,150	858	1,234	717	1,244
May	1,161	850	1,246	709	1,231
June	1,171	843	1,253	703	1,235
July	1,155	814	1,232	690	1,204
Aug.	1,164	818	1,208	701	1,214
Sept.	1,161	809	1,224	715	1,237

U. S. Bureau of Labor Statistics

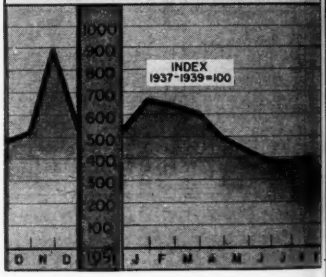


Fabricated Structural Steel

Thousands of Net Tons

	Shipments 1951	Shipments 1950	Backlog 1951	Backlog 1950
Jan.	214.0	154.7	1,067	756
Feb.	193.6	149.8	1,143	780
Mar.	237.1	185.2	1,088	762
Apr.	234.1	187.8	1,093	727
May	234.5	194.8	1,121	785
June	257.1	202.4	1,111	781
July	204.3	165.5	1,135	920
Aug.	239.8	218.4	1,184	1,009
Sept.	229.3	198.7	1,086	993
Oct.	....	....	211.8	 1,018
Nov.	....	....	193.8	 1,034
Dec.	....	....	212.9	 1,007
Total	....	2,275.9	....	....

American Institute of Steel Construction



Foundry Equipment

	Index 1951	Index 1950	Value in Thousands 1951	Value in Thousands 1950
Jan.	668.0	159.3	$3,075	$731
Feb.	638.6	113.1	2,940	519
Mar.	599.0	225.2	2,758	1,034
Apr.	490.1	160.6	2,256	737
May	431.7	294.9	1,987	1,353
June	393.2	622.7	1,810	2,858
July	390.3	401.8	1,797	1,844
Aug.	404.5	693.6	1,862	3,183
Sept.	346.5	483.8	1,595	2,220
Oct.	....	526.8	....	2,417
Nov.	....	885.5	....	4,077
Dec.	....	526.2	....	2,412

Foundry Equipment Mfrs. Assoc.

Charts—Copyright 1951, STEEL

last year. Other 10-month figures: Commercial building, at $542 million, is off 36 per cent; private housing awards, totaling $1676 million, are down 30 per cent.

Coal Piles High for Winter . . .

Cold weather last week will make many people look twice at their coal piles. Luckily for them there is plenty on hand if they haven't stocked up yet. At the beginning of October, the U. S. Bureau of Mines says 76,245,000 net tons of bituminous were on hand, down only 747,000 tons from the eight-year stock peak established in July. Industrial users held almost 19 per cent more coal on hand than in October, 1950. Retail dealers had cut their supplies 23 per cent from that time last year. Coal on hand is enough to last 66 days at present rates of consumption.

Expert's Estimates . . .

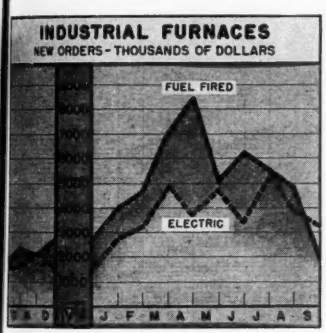
Gross national product will be $334.3 billion in the fourth quarter, and $348.6 billion in the fourth quarter of 1952. That's the average estimate of 128 economists polled by F. W. Dodge Corp. Third-quarter rate was $328 billion, the government says. The economists believe that production will rise continuously from now until the end of next year. Construction will decline a bit, but still be of boom proportions. Opinions were asked as to when economic controls will end. Some median dates: Steel—second quarter 1953; copper—third quarter 1953; aluminum, prices, wages, salaries—fourth quarter 1953.

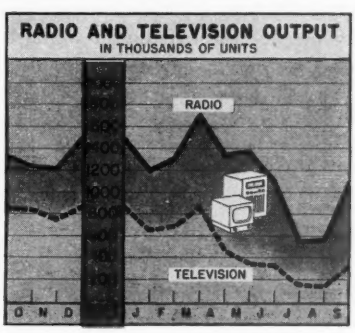
Trends Fore and Aft . . .

Factory layoff rate continued high in September, 13 per 1000 workers. Hiring for the third consecutive month was at the lowest rate for the season in over a decade, except for 1949. The rate was 43 per 1000 in September. Quits were unchanged at 31 per 1000 workers . . . New business incorporations in September—5957—were at a six-year low . . . Consumers increased their installment debt by $112 million in September . . . The textile industry expects further slumps.

Issue Dates of other FACTS and FIGURES Published by STEEL:

Construction Oct.29	Ironers Nov.5	Refrigerators Oct.1
Durable Goods Oct.8	Machine Tools Nov.5	Steel Castings Oct.22
Employ., Steel Oct.29	Malleable Castings..Oct.22	Steel Forgings Aug.20
Freight Cars Oct.22	Prices Oct.1	Steel Shipments ...Nov.5
Furnaces, W. Air ..Sept.17	Pumps, New Orders.July9	Vacuum Cleaners ...Oct.29
Gear Sales Nov.5	Purchasing Power ..Oct.8	Wages, Metalwkg. ..Oct.22
Gray Iron Castings..Oct.22	Ranges, Elec. Oct.29	Washers Nov.5
Indus. Production ..Oct.1	Ranges, Gas Oct.29	Water Heaters Oct.1





Industrial Furnaces

New Orders—Thousands of Dollars

	Fuel Fired*		Electric	
	1951	1950	1951	1950
Jan.	4,033	1,914	2,764	473
Feb.	4,670	616	3,212	697
Mar.	7,019	1,300	4,846	753
Apr.	8,497	837	3,657	415
May	5,044	1,392	4,766	982
June	6,259	1,166	3,370	1,328
July	5,303	2,247	5,587	1,445
Aug.	4,850	3,927	3,891	1,039
Sept.	1,821	1,817	3,250	1,485
Oct.	....	2,306	....	1,603
Nov.	....	2,068	....	2,157
Dec.	....	2,749	....	1,505

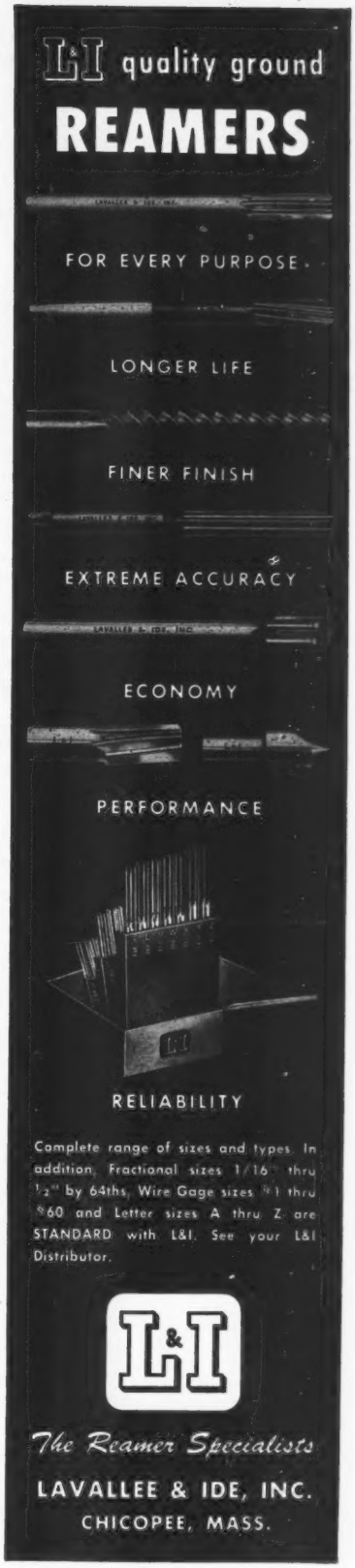
* Except for hot rolling steel.
Industrial Furnace Mfrs. Assn.

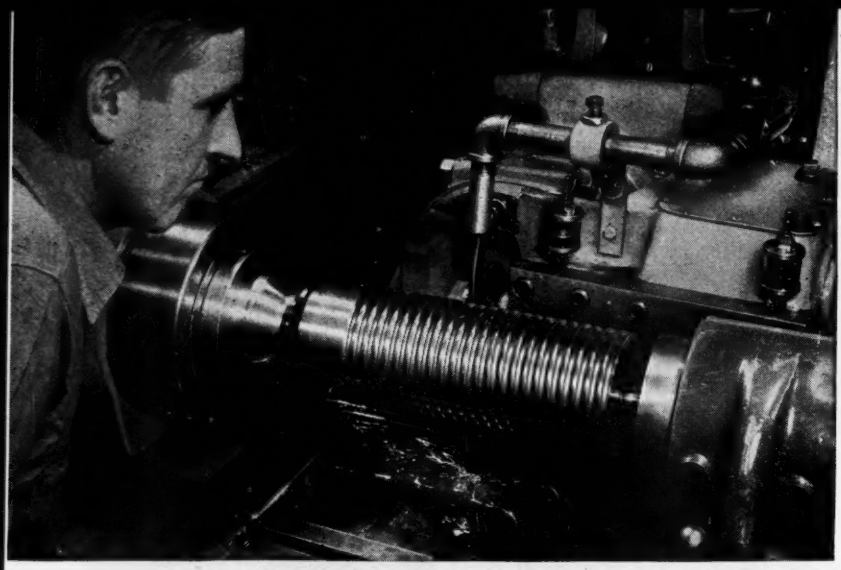
Radio and Television Output

Thousands of Units

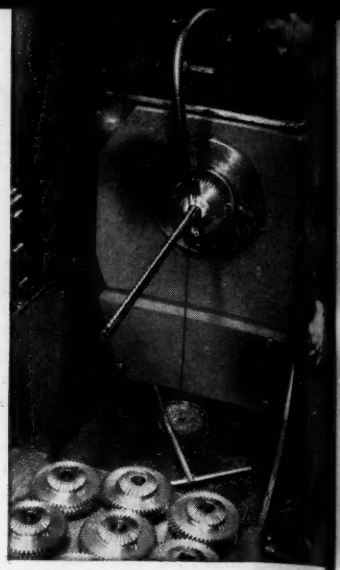
	Radio		Television	
	1951	1950	1951	1950
Jan.	1,203	935	646	439
Feb.	1,313	1,059	679	480
Mar.	1,720	1,349	875	687
Apr.	1,337	1,254	469	543
May	1,373	1,245	339	486
June	1,083	1,491	327	502
July	548	666	152	327
Aug.	563	1,304	147	721
Sept.	1,100	1,335	337	844
Oct.	....	1,230	...	538
Nov.	....	1,216	...	739
Dec.	....	1,506	...	858
Total	....	14,590	...	7,464

Radio-Television Mfrs. Assoc.


L&I quality ground
REAMERS
FOR EVERY PURPOSE
LONGER LIFE
FINER FINISH
EXTREME ACCURACY
ECONOMY
PERFORMANCE
RELIABILITY
Complete range of sizes and types. In addition, Fractional sizes 1/16" thru 1/2" by 64ths, Wire Gage sizes #1 thru #60 and Letter sizes A thru Z are STANDARD with L&I. See your L&I Distributor.
L&I
The Reamer Specialists
LAVALLEE & IDE, INC.
CHICOPEE, MASS.



THREAD MILLING A SCREW. Metal: SAE 2345 steel heat-treated to 28 Rockwell • Machine: Lees Bradner thread miller • Part: 5¼" adjusting screw for press brake • Operations: rough and finish thread milling Tool: high-speed steel • Feed: 0.260 depth on roughing Cutting Oil: Sunicut 105



BROACHING A GEAR KEY-WAY. Metal: SAE 2345 steel forging 220 Brinnell • Machine: 3L8 La Pointe hydraulic broach • Part: gears for shaper, produced two at a time • Tool: 3' high-speed steel broach • Cutting Oil: Sunicut 105

SUNICUT 105 REPLACES THREE OILS AND SOLVES FIVE MAJOR PROBLEMS

Buying three cutting oils and then blending them to make additional grades had proved highly unsatisfactory to a machine tool builder. The smoke was noxious, employees complained of skin irritations, the color of the oils made it difficult to see the work, tool life was short and finishes not up to standard. To help solve these problems, the company called in a Sun representative and on his advice tested Sunicut 105 on the three tough jobs pictured here.

So good were the results that the company adopted Sunicut 105 for every machine in the plant and has used it exclusively for the past two years. The operators like its transparency. There are no complaints about smoke or skin irritations. Finishes have improved and tool life increased as much as 50 percent.

For complete information on Sun's cutting oils, write to Department S-9 and we will send you a copy of our informative, illustrated booklet "Cutting and Grinding Facts."

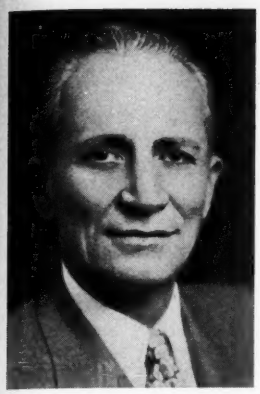
CUTTING A LARGE GEAR. Metal: bronze 180 Brinnell • Machine: Gould & Eberhardt gear hobbing machine • Part: main drive worm gear wheel for large shear • 42⅝" O. D.; 5" thick; 87 teeth • Tool: high-speed steel hob • Feed: 0.006 • Speed: 42 rpm • Cutting Oil: Sunicut 105

SUN INDUSTRIAL PRODUCTS

SUN OIL COMPANY, PHILADELPHIA 3, PA. • SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

SUNOCO®

Men of Industry



E. H. STAU
. . . sales mgr. of Townsend's Pacific Div.

E. H. Stau was appointed sales manager of a newly created Pacific Division of **Townsend Co.,** New Brighton, Pa. He formerly was general manager of Cherry Rivet Co., a division of Townsend. In addition to directing sales activities for the parent company on all Townsend cold-headed metal products on the Pacific Coast, Mr. Stau will direct aircraft and government contacts for the Cherry Rivet line of specialized fasteners on a national basis.

L. J. Smith was appointed to the newly created position of eastern regional sales manager, **Chiksan Co.,** Brea, Calif. His headquarters will be in Newark, N. J., where he served as a field engineer for the last four years.

Lorenzo S. Washburn was appointed quality manager of **Norton Co.'s** abrasive division to succeed **Charles J. Hudson,** retired after 34 years' association with the company, but who continues as quality consultant to the division. **Clarence W. Halleen** replaces **Irving B. Loud** as superintendent of plants 1, 2 and 3. Mr. Loud retires after 35 years with the company. Mr. Halleen also will supervise the tunnel kilns and vitrified molding in plant 6. **John Matson** becomes assistant superintendent of these departments.

James L. Brown was named sales manager for receiving tubes and cathode ray tubes for **Westinghouse Electric Corp.,** with headquarters at Elmira, N. Y. **Carl F. Miller** was named manager, receiving tube development and design engineering, with headquarters at Bath, N. Y.

THOMAS F. GRIFFIN
. . . Worthington's Holyoke purchasing agent

Worthington Pump & Machinery Corp. appointed **Thomas F. Griffin** purchasing agent at its Holyoke, Mass., Works to succeed **Milton Roberts,** resigned to engage in another business. Since May, 1950, Mr. Griffin has been general buyer in the general purchasing department, Harrison, N. J., and is succeeded in that position by **LeRoy D. White,** former co-ordinator of the contract engineering division.

Harry Oldham joined the engineering staff of **Sutter Products Co.,** Dearborn, Mich. His 48 years of experience in ferrous and nonferrous foundries will be applied to development and design of new foundry equipment, particularly in the shell molding process, and on customer service. Mr. Oldham in 1947 became general foundry superintendent, Mack Trucks Inc., and in 1950 joined Hunt-Spiller Mfg. Corp. as foundry superintendent.

Jones Metal Products Co., West Lafayette, O., appointed **Herbert Boyer** vice president in charge of sales, **L. E. Reed,** administrative assistant to Mr. Boyer and **R. P. Harner** to fill the newly created position of director of sales, ABolite Lighting Division. Mr. Boyer was secretary-treasurer.

Charles D. McCall was appointed general sales manager, **New Departure Division,** General Motors Corp., Bristol, Conn., to succeed **Frank J. Miller,** resigned. **Lorne F. Lavery** replaces Mr. McCall as Detroit regional sales manager of the division, and **Howard A. Offers** moves from Chicago where he was manager, Midwest regional office, to Bristol as assistant general sales manager.

RAYMOND B. CREAN
. . . V. P.-Southwark Div., B-L-H

At the Eddystone, Pa., plant of **Baldwin-Lima-Hamilton Corp., Raymond B. Crean,** vice president, now has responsibility for the Southwark Division, including hydraulic turbines, presses, power tools, testing machines and other products built in the Southwark shops. **John S. Newton,** vice president, has responsibility for the locomotive division; and **James R. Weaver,** vice president, for the newly created defense and special products division.

Baker-Raulang Co., Cleveland, elected **Edwin W. Sankey** as vice president and assistant to the president, and **John A. Matousek** as vice president in charge of manufacturing. Mr. Sankey has been purchasing agent since 1933 and continues supervision of that department. He will also coordinate engineering and manufacturing, and will work with the sales department in planning and executing a development program. Mr. Matousek was appointed manufacturing manager in 1949.

Robert A. Bower, formerly assistant general purchasing agent, was appointed assistant to the executive vice president of **Doehler-Jarvis Corp.,** New York. He is succeeded by **Mark F. Beckington,** formerly senior buyer at Kaiser-Frazer Corp., who joined Doehler-Jarvis in 1949.

Andrew E. St. John was elected vice president and treasurer of **Alloys & Products Inc.,** New York. In addition he will be in charge of company manufacturing operations.

Lincoln Engineering Co., St. Louis manufacturer of equipment for appli-

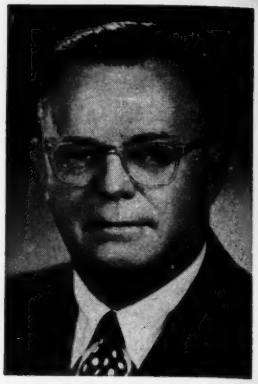
cation of lubricants, elected **L. L. Meikle** as president of Lincoln Engineering Co. of California. He succeeds **C. Homer Redd,** who continues in an advisory capacity. Mr. Meikle was general manager.

Taylor-Wharton Iron & Steel Co., Cincinnati, appointed **Ralph G. Detmer** vice president - trackwork division, to co-ordinate all phases of the trackwork operation. He is located at the executive offices at Cincinnati. The trackwork plants are at Easton, Pa., Birmingham, and Cincinnati. He was vice president and general manager of American Frog & Switch Co., subsidiary, until consolidation in 1949 of it and Taylor-Wharton with Weir Kilby Corp. At that time he became assistant to the president-sales and engineering.

Theodore R. Treadwell was appointed sales manager of **Clover Mfg. Co.,** Norwalk, Conn., in charge of its entire line of products, including both coated abrasives and grinding and lapping compounds.

Revere Copper & Brass Inc., New York, elected **James J. Russell** chairman of the board and chief executive officer, and **James M. Kennedy** as president. Mr. Russell, formerly president, succeeds **C. Donald Dallas,** who continues as a director. Mr. Kennedy, formerly vice president in charge of the Rome, N. Y., Mfg. Co. division, was also in charge of the Riverside, Calif., and Clinton, Ill., manufacturing divisions. **Chester M. McCreery** assumes charge of these divisions, and will be assisted at the Rome division by **Edwin D. Howell,** former works manager at Clinton. Mr. McCreery was sales manager for Revere Ware, fabricated at the Rome division. **Harold J. Schindler** succeeds Mr. Howell at Clinton.

K. B. ELLIOTT
. . . exec. V. P. of Studebaker



P. O. PETERSON
. . . exec. V. P. at Studebaker

K. B. Elliott and **P. O. Peterson** were elected executive vice presidents of **Studebaker Corp.,** South Bend, Ind., and **E. C. Mendler** and **R. A. Hutchinson** were elected vice presidents. Mr. Elliott formerly was vice president in charge of sales, and Mr. Peterson, vice president of manufacturing. Mr. Mendler formerly was general manager, parts and accessories division, and Mr. Hutchinson was general manager of the export division. As in the past each will continue responsibility for his department, reporting directly to **Harold S. Vance,** chairman of the board and president.

F. E. Gibson was elected treasurer of **Graybar Electric Co.,** with headquarters in the general department in New York. He was district credit manager at Chicago.

Horace T. Potts Co. announces appointments in its Philadelphia organization: **Arthur L. Collins** is director of sales; **W. Hughes Dunlap,** special assistant to director of sales; **John W. Reckard,** sales manager; **John H. Kern,** assistant to sales manager (office sales); **Joseph J. Folz,** assistant to sales manager (stainless steels); **Donald C. Taylor,** assistant to sales manager (tool steels); **Clee O. Worden,** assistant to sales manager (machinery steels); **Roy K. Clement,** assistant to sales manager (special products); and **Robert A. Neeley,** assistant purchasing agent.

Vonnegut Moulder Corp., Indianapolis, appointed **Oliver S. DeHaven** to reassume duties of chief engineer after an absence of four years. **Eric Lindenborg** joined the engineering division in charge of demonstrations and experiments related to Vonnegut grinding and polishing equipment.

George R. Hanks was elected president, **American-LaFrance-Foamite Corp.,** Elmira, N. Y. He succeeds **Edward E. O'Neill,** resigning because of ill health. **Wilfred M. Price** was elected executive vice president.

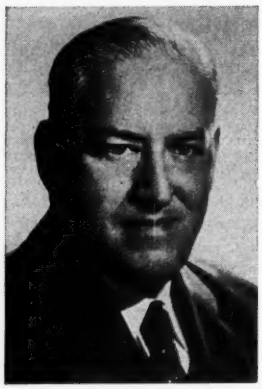
John H. Harrison was appointed a sales supervisor in the Southwest district of **York Corp.,** with headquarters in Houston. He was associated in a similar capacity with Wells Mfg. Corp. He succeeds **L. B. White.**

Jesse L. Powers was appointed assistant general manufacturing manager, **Buick Motor Division,** Flint, Mich., General Motors Corp. He succeeds the late **Walter N. Larke. Donald F. Taylor** becomes general superintendent in charge of ordnance production at Buick.

Victor A. Noel was elected vice president in charge of sales, **Ritter Co.,** Rochester, N. Y. He had been general sales manager since 1942.

Al Dunn was named manager of manufacturing at the assembly plant in

JAMES J. RUSSELL
. . . Revere chairman and chief exec. officer



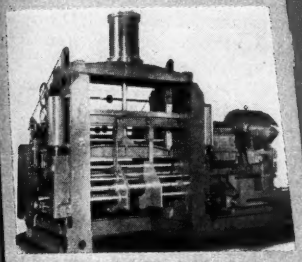
JAMES M. KENNEDY
. . . new president of Revere

The WEAN ENGINEERING Company, Inc.

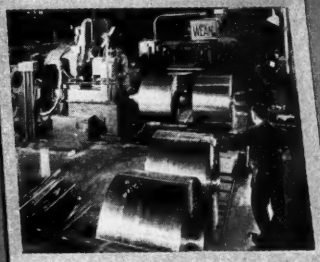
WARREN, OHIO

Continuous Strip Pickle Line

Processing Uncoiler



Continuous Electrolytic Cleaning Line



Continuous Hot-Dip Galvanizing Line

Associated Companies

WEAN EQUIPMENT CORPORATION
Cleveland, Ohio

WEAN MANUFACTURING CO.
Warren, Ohio

THE McKAY MACHINE COMPANY
Youngstown, Ohio

FLINN & DREFFEIN ENGINEERING COMPANY
Chicago, Illinois

THE HALLDEN MACHINE COMPANY
Thomaston, Connecticut

THE DREVER COMPANY
Philadelphia, Pennsylvania

THE WEAN ENGINEERING CO. OF CANADA, LTD.
Hamilton, Ontario

REPRESENTATIVES

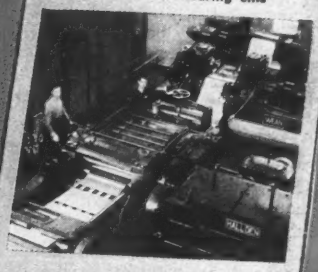
England—
JOHN MILES & PARTNER
(London, Ltd.)
London, England

France—
P. DAMIRON & CC
Paris, France

NORVIL COMPANY
Milan, Italy

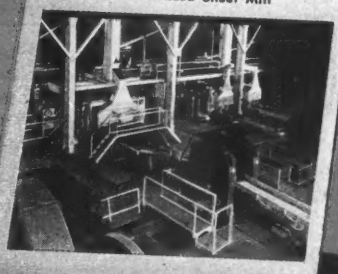
Continuous Coating Line

Tin Plate Shearing Line



Hot-Dip Tinning Units

Mechanized Sheet Mill



SPECIALISTS IN SHEET, TIN AND STRIP MILL EQUIPMENT

L. I. BARKER
. . . Republic's Cleveland sales mgr.

FLOYD E. MENGEL
. . . Morton Machine Works gen. mgr.

WILLIAM J. WELCH
. . . manages National Lead's metal dept.

Buffalo of **Ford Motor Co.** He succeeds **E. M. Timmons,** newly appointed body superintendent.

L. I. Barker was appointed Cleveland district sales manager for **Republic Steel Corp.** He replaces **Paul R. Johnston,** resigned. Since 1945 he has been assistant district sales manager at Cleveland for Republic and subsidiaries.

C. S. Larson, manager of the special machinery engineering department, **A. O. Smith Corp.,** Milwaukee, retired after 31 years with the company.

Clarke A. Silcott was appointed general manager, and **K. J. Flood,** manufacturing manager of the engine division of **Kaiser-Frazer Corp.,** Willow Run, Mich. Mr. Silcott succeeds **T. A. Bedford,** recently appointed K-F vice president in charge of manufacturing. **D. L. Mapes** was appointed procurement director of the engine division.

Frank W. Chambers was appointed director of engineering, **Kennecott Copper Corp.,** New York. Since 1949 he has been production manager of the engineering and construction division of Koppers Co. Inc., and was associated with that company for many years. He assumes his new position about the middle of this month.

Floyd E. Mengel was appointed general manager in charge of sales and manufacturing, **Morton Machine Works,** Detroit. **Eric Butterworth** was appointed manufacturing superintendent.

Walter Anderson was named purchasing agent of **Royal Metal Mfg. Co.,** Chicago, and **Drex Drehmel** was appointed assistant purchasing agent.

C. Stuart Haagensen was appointed director of industrial and public relations of **Ampco Metal Inc.,** Milwaukee. For the last 12 years he has been in the industrial relations division of Allis-Chalmers Mfg. Co.

National Supply Co., Pittsburgh, promoted **Francis H. Elliott** to assistant general credit manager at its engine division and export division, and **Stanley L. Furman** as assistant general credit manager, eastern and northwest oilfield divisions.

Carboloy Department, Detroit, General Electric Co., transferred **Arthur E. Johnson** from its customer training school in Detroit to its Pacific district office, Huntington Park, Calif.

William Bynum was elected executive vice president of **Carrier Corp.,** Syracuse, N. Y. He was vice president-general sales manager.

William J. Welch was appointed manager of **National Lead Co.'s** metal department, New York. He joined the company in 1916, and was made assistant to the manager, metal department, in 1947. In October of that year he became manager of the metal sales department.

Aetna-Standard Engineering Co., Pittsburgh, announces the following changes: **R. D. Johnson,** formerly general manager, Ellwood City, Pa., and Warren, O., plants, was named assistant to the vice president, **H. G. Coffey.** He is succeeded at Ellwood City by **T. C. Ben. Lawrence R. Jeffers** takes over as general superintendent of the Ellwood City plant, with **W. E. Durstine** as assistant. **James H. Rauch** was appointed superintendent, roll department, and **R. R. Kelly,** office and traffic manager, Ellwood City.

John G. Cherry was elected president of **Cherry-Burrell Corp.,** Chicago. He succeeds the late **John W. Ladd.**

W. H. Prewitt Jr. succeeds **L. C. Barton,** retired, as manager of **Wagner Electric Corp.'s** Atlanta branch.

Consolidated Vultee Aircraft Corp., San Diego, Calif., appointed **Quentin G. Turner** manager of industrial engineering, Convair Guided Missile Division, Pomona, Calif.

OBITUARIES...

Robert N. Blakeslee, 58, vice president and director of engineering, **Ajax Electrothermic Corp.,** Trenton, N. J., died Oct. 17. He was associated with Ajax for 24 years.

George A. Barclay, a steel plant executive in the U. S. and Canada for 44 years, died Oct. 28 in Buffalo. He formerly was superintendent of mills at **Bethlehem Steel Co.** and in later years held the same post with **Steel Co. of Canada** in Hamilton, Ont. He retired in 1948.

Phil S. Harvey, vice president, **C & D Batteries Inc.,** Conshohocken, Pa., died Oct. 27.

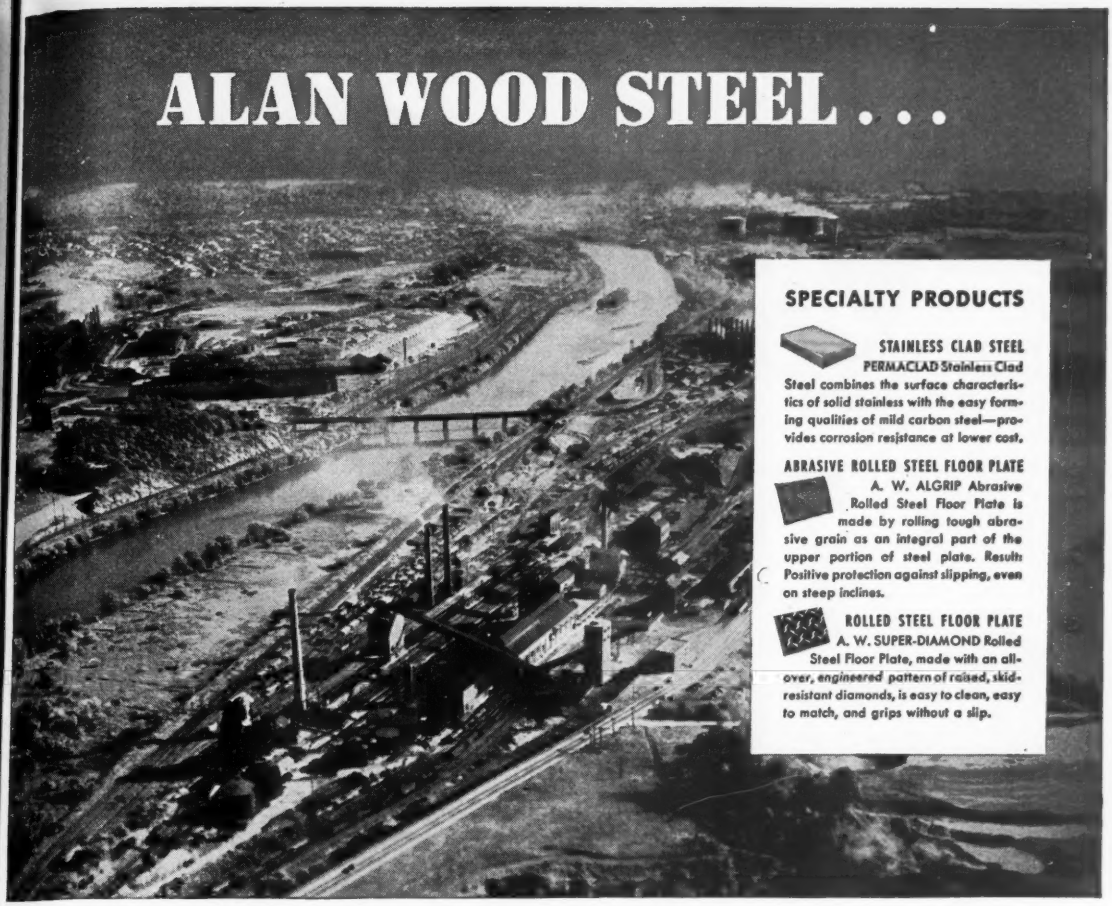
M. R. Peck, 67, vice president, **McKay Co.,** Pittsburgh, died of a heart attack Oct. 25.

W. I. Abrams, 52, president of **Atlas Foundry Co.,** Irvington, N. J., died Oct. 28.

Earl W. Mikels, 62, production manager, chain department, **Diamond Chain Co. Inc.,** Indianapolis, died Nov. 3.

Alfred R. Bolger, vice president of **F. L. Heughes & Co.,** Rochester, N. Y., died Oct. 26.

ALAN WOOD STEEL . . .



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PERMACLAD Stainless Clad Steel combines the surface characteristics of solid stainless with the easy forming qualities of mild carbon steel—provides corrosion resistance at lower cost.

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A. W. ALGRIP Abrasive Rolled Steel Floor Plate is made by rolling tough abrasive grain as an integral part of the upper portion of steel plate. Result: Positive protection against slipping, even on steep inclines.

ROLLED STEEL FLOOR PLATE
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Conshohocken, Pa.

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Tank, Ship, Boiler. Flange and Structural Qualities
Furnished in carbon, copper, or alloy analyses
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Special qualities in carbon, copper, or alloy analyses
A.W. Dynalloy (High Strength Sheets)

HOT ROLLED STRIP
Coiled and cut lengths
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A.W. ROLLED STEEL FLOOR PLATES
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A.W. Super-Diamond Pattern

STAINLESS-CLAD STEEL
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Standard and special qualities available in desired finishes

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Iron Ore Concentrates,
Sintered Concentrates, Crushed Stone, Grit, Sand and Engine Sand

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COAL CHEMICALS
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On three operations in the set-up pictured here—machining nickel-moly steel (4615) at 135 to 150 s.f.m.—the superintendent kept careful records of tool performance. It was found that MO-MAX COBALT High Speed Ground Tool Bits ran *43% to 100% longer* that the tool bits previously used. In the break-down operation MO-MAX ran 4 hours, as compared with 2 hours for the other steel. In facing, it was 5 hours against 3½ hours. In cut-off, 4 against 2½. This is one of hundreds of tests in which both MO-MAX and MO-MAX COBALT Tool Bits have demonstrated their superiority. So if *you* have a difficult machining problem, a *Cleveland* Service Representative will be glad to give helpful suggestions. Contact our nearest Stockroom, or . . .

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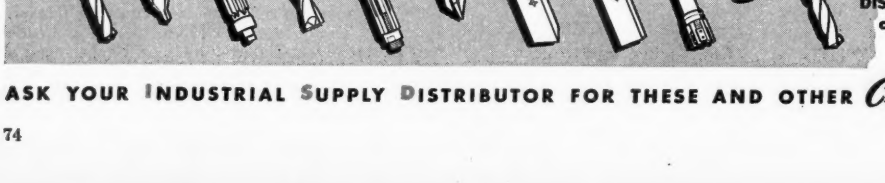

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Production AND Engineering
NEWS AT A GLANCE

JUST SO IT'S STEEL— Production manager of a plant busily engaged in turning out scores of domestic furnaces and blower units watched the finished cabinets slide by on an overhead conveyor from the spray booth. To a routine question as to what type of flat-rolled steel was used in fabrication of the cabinets he threw up his hands and said, "Who knows? Hot rolled, cold rolled, single pickled and oiled, anything that will take the paint. Mill stuff, warehouse, 'conversion', 16-gage, 18-gage, just so it's steel." His answer is probably typical of many an operator tearing his hair these days trying to keep an assembly line moving.

TO HIT THE ROADS— When the current defense emergency eases, one of the first major projects to get under way will be roadbuilding in a big way. The recent blast from General Motors on the sorry state of the nation's roads and highways, along with the antiquated planning and woefully inadequate spending behind them was the tipoff if one was needed. Manufacturers of all types of roadbuilding machinery, supplies, materials, bridges, culverts, roadguards, reinforcing and the like can expect a tremendous boom. Timing is the only question.

NO DEAD INVENTORY— A Chicago warehouse is now equipped to reroll 2000 tons of strip steel per month to customers' specifications. Facilities consist of a two-high 700 hp, 3-stand 16-inch tandem cold reducing mill, bright annealing and pickling equipment for strip and for wire. The new rolling capacity will be used to supplement supplies from regular mill sources and to produce steel to standard as well as to intermediate tempers and tolerances. p. 90

HOT LACQUERED AMMO— Increasing quantities of materiel and ammunition for the Army, Navy and Air Force are being finished by hot lacquer spraying methods, approved under various MIL specifications. Covering both primers and finish coats, the specs recognize hot lacquering's advantages: Increased coverage per gallon, fewer coats, better flowout and less tendency to sag, better cold check resistance, higher contact temperature, less waste of solvent. One spec details a fast-drying, one-coat finish for phosphated or primed shells, bombs, grenades and other ammunition components. It is also designated as a 1 mil thick finish coat for army tanks. This particular formulation comes in eight standard colors—white, black, light blue, red, yellow, olive drab, green and blue-gray. p. 76

SPECIFIC STANDARD TAPS—"Specific" taps, specifically designed and produced for tapping specific materials are now standardized and carried as regular catalog items under a new program initiated by Detroit Tap & Tool Co. Steel and other tough materials, cast iron, aluminum, magnesium and other light substances, zinc die casting metals, brass and plastics are the materials for which the specific taps are available. So in addition to general purpose standard taps, the company now offers six lines of "specific" taps.

SIMPLIFIED SHELL LATHE— A veteran machinery expert, active principally in the rebuilding field, has evolved a design for a single-purpose shell turning lathe, featuring tubular ways, standard accessories and a number of other ideas suggesting it might be built in quantity and in a hurry at a particularly attractive price. Prints have been shown to Army Ordnance engineers who reportedly are much interested.

EARN TO LEARN AND LEAVE— Manual welding of armor plate requires more than ordinary skill on the part of the welder if his work is to pass the rigorous eye of the x-ray. Hence a large Ordnance facility set up an elaborate welding school with dozens of booths where individual operators could be trained. Several weeks of instruction are required before the welder can be turned loose on production work. One unfortunate outgrowth of the project has been a high degree of turnover in trained welders, many leaving the plant to accept high-paying jobs in smaller plants in the area. That is one way of getting paid to learn a skilled trade.

FAST-REVERSING MOTOR— Small electric motors can be reversed in 3 to 4 milliseconds using a method developed at the National Bureau of Standards. Kinetic energy of the rotor, instead of being dissipated as heat in a brake during deceleration, is converted into potential energy in a spring and then used to accelerate the rotor rapidly in the opposite direction. Designed to meet the need for high-speed reversal of magnetic tapes in electronic digital computors, the technique might be applied to reversing rolling mills. p. 97

SAVES COPPER AND CASH— The Navy has come up with at least one idea for saving critical copper and Navy funds. The idea is to increase the length of planking used on naval vessels and thus reduce the number of fastenings between the timbers. By adopting glued scarf, or notched joints in specifications for planking wooden minesweepers, the Navy can save $3320 per vessel in planking installation alone. Instead of using only solid planking members, shipbuilders are encouraged to use the new scarfed material. With more planking available for shipbuilding, fewer butt joints between planks are needed. Each joint has six silicon bronze fasteners. And silicon bronze is about 94 per cent copper, just about the scarcest of many scarce metals these days.

Metalworking Outlook—p. 40 *Market Outlook—p. 143*

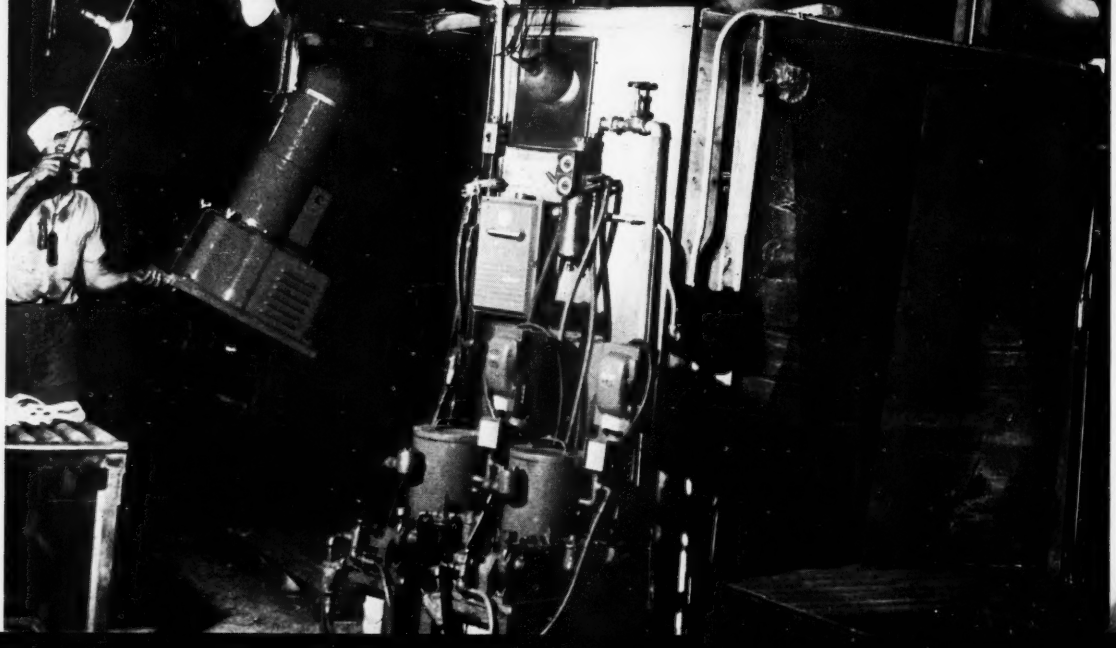
BROADER USE OF HOT-SPRAYED LAC

Seen on Military Equipment

Higher proportion of solids at the gun means fewer coats, less labor, less solvent and better flowout of the finish. Heating units may be either in the gun or on a separate tank. Estimates indicate 4000 are now in use

MILITARY specifications for sprayed and dipped finishes on materiel and equipment have been going through a process of co-ordination, amendment and upgrading, particularly in respect to lacquer coatings. Army, Navy and Air Force have at times indicated a willingness to allow deviations from the specifications originally designated to permit contractors to achieve economies in either time or cost through use of lacquer. All that is generally necessary is a check with the procurement office involved to discuss advantages and obtain approval.

One recent military specification is MIL-P-11414, covering a quick-drying, rust-inhibiting cellulose nitrate primer for use as a prime coat under lacquers and enamels. Demand for it arose from contractors reluctant to accept 6-8 hours of drying time for conventional primers. The specification was devised to withstand the rich solvent action of hot lacquer, while providing a durable, adherent base for enamels. Pigment requirements are a minimum of 10 per cent zinc chromate and 50 per cent iron oxide, with a maximum of 40 per cent siliceous extenders. Nonvolatile vehicle calls for minimum of 30 per cent cellulose nitrate (dry), 55 per cent phthalic alkyd type resins (containing a minimum of 34 per cent phthalic anhydride), and 10-15 per cent platicizers, with no resin or phenol. Volatile portion is a minimum of 30 per cent esters and ketones, 15-22 per cent alcohols and



Recently installed at Lincoln Electric Co., Cleveland, is this hot spray booth and equipment for finishing welders, one of which is shown coming from the booth at the left. Hot spraying means important savings in lacquer consumption

ED LACQUER

maximum of 50 per cent hydrocarbons. The spec lists drying times as: Set to touch, 3 minutes maximum; dry through in 6 minutes and full hardness in 48 hours.

Ammunition Is Covered—Specification MIL-L-11195 covers lacquer (room temperature or hot spray) for ammunition, being issued last June. It details a fast-drying, one-coat finish for phosphated or primed shells, bombs, grenades and other ammunition components. It has also been designated as a finish coat for army tanks in 1.0 mil thickness, and conceivably may be considered for self-propelled guns, amphibious cargo carriers, buses and other ordnance equipment. Quantitative limits on the vehicle content of the lacquer are similar to the primer material, except that the minimum on esters and ketones is higher, being set at 37.5 per cent. Pigmentation is dependent upon the color desired, there being eight standard colors—white, black, light blue, red, yellow, olive drab, green and blue-gray.

Detailed requirements are set forth in respect to hot spray application of this material: Atomization air pressure 50 pounds maximum, cold lacquer feed tank pressure 10-15 pounds, lacquer temperature at spray gun 160° F plus or minus 5°, distance from spray gun to work 6-8 inches, lacquer flow rate at nozzle 10-20 fluid ounces per minute, thermostatic setting on lacquer heating unit 175° F maximum.

Air drying time requirements (on glass) are: Set to touch 4-6 minutes, dry hard 8 minutes, dry through 10 minutes maximum, and full hardness (on metal) 48 hours.

The military specification covering quick-drying synthetic enamel for ammunition, issued last November, is MIL-E-10687. Vehicle specified is a styrenated glyceryl-phthalate-alkyd resin, and air drying time is: Set to touch 3-6 minutes, hard 10 minutes maximum, through 20 minutes maximum, and full hardness 72 hours.

Aircraft Specs Co-ordinated — Another relatively new lacquer spec is MIL-L-7178, applying to a cellulose nitrate glossy lacquer for aircraft uses. It is a co-ordination of two earlier specifications. Extensive work on this lacquer has been under guidance of the Philadelphia Navy Aeronautical Experimental Station to broaden its application by hot spray to naval aircraft. Bearing on this type of usage is the Navy's requirement for increased abrasion and gasoline resistance of the finish, based on experiences in the

For the future there are logical prospects for broadened military usage of both hot and cold-applied lacquer. They include: Metal and wood furniture, ordnance equipment and ammunition, military aircraft, procoating of cans, and other Quartermaster items such as typewriter cases, helmets, caskets, containers and the like. There may even be some possibilities in coating structural steel sections such as Bailey bridge units, landing mats, etc. which are now enameled and call for prolonged drying.

Hot-spraying installation for coating interiors of furnace blower cabinets at Perfection Stove Co., Cleveland. Lacquer is sprayed under 30 pounds pressure automatically held at 150 °F

Quality Steadily Higher—The five essential ingredients of lacquers—pigment, resin, plasticizer, nitrocellulose and solvent—have been subject to a steady improvement over recent years. New pigments have come along, in which chalking and fading can be controlled to any desired degree, while opacity has been increased so that full hiding is more easily obtained. Better resins are setting new standards in resistance to humidity, sunlight, weathering, tropical exposures, subzero temperatures, rapid changes in temperature and reflectance. Nitrocellulose itself has shown steadily higher quality, in terms of greater uniformity, clarity and stability. Solvents have multiplied and the lacquer manufacturer is no longer limited to alcohols and esters derived from the fermentation process.

One important advance has been the development of higher solids "at the gun". By proper selection of resins and solvents, 25-35 per cent solids now can be sprayed cold, and up to 45 per cent solids by hot spray, instead of the 15-20 per cent of a few years ago.

Hot Lacquering Expands — Along with this has come widespread adoption of the hot-spray method of application. This is a matter of simple economics. As lacquer temperature goes up, its viscosity decreases; in other words it is thinned by heat instead of extra solvents. The heat (150-160° F) is induced either by a special type of gun or with a separate heater tank, coils, pump, etc. The lacquer solids thus are applied with far less dilution, which means a higher proportion of solids per coat, fewer coats, less labor, less

solvent—all of which more than offset the added cost of the heating equipment. An example of the awareness of the military to these new developments is the above discussed MIL-L-11195 where as much as 45 per cent solids in certain colors may be called for.

It is estimated there are approximately 4000 heating units now in operation in the finishing industry, about 1500 of them being sold last year alone. There are at least eight types available, brief descriptions of which follow:

1. Arco Co., Cleveland, has a unit which is a small heat exchanger and can be inserted in the fluid line, either adjacent to the spray gun or a few feet from it. The heating medium is steam. A feature is that heat is applied to the lacquer only as used; thus there is efficient delivery of hot lacquer to the gun without the need of a circulating system. Capacity of the present design is 1½ pints per minute at 160° F, although higher capacities are being developed.

2. Beck Equipment Co., Cleveland, has an electric heating unit in which hot water or a permanent heat-transfer liquid is the heating medium. Lacquer is circulated to the spray gun through a circulating system powered by an air pump. Provision is made for heating the air used in spraying, if desired. Capacity is 1 quart per minute at 160° F. Larger capacity is possible by powering with a 4500-watt unit instead of the standard 3250-watt element. The equipment is mounted on a movable platform.

3. Bede Products Inc., Cleveland, also offers an electric heating unit (STEEL, March 12, P. 85), with the heating element and the coil containing the lacquer to be heated embedded in a single aluminum casting. Hot lacquer is circulated to the spray gun through a system powered by an air pump which draws directly from a lacquer container, so that a pressure tank is not required. Provision is made for heating the air to the gun, if desired. Capacity of the standard unit is slightly in excess of 1 quart per minute at 160° F. Also available is a larger heater having capacity of better than 2 quarts a minute.

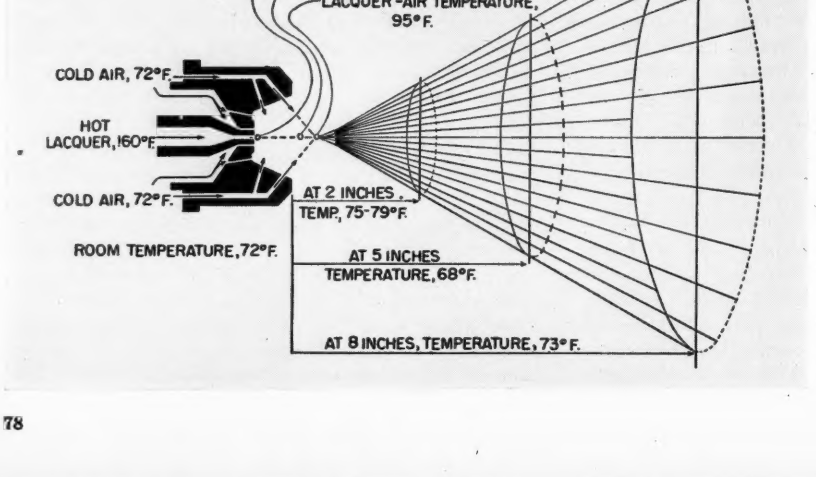
4. DeVilbiss Co., Toledo, has a rather large stationary-type unit with unusually high capacity. At least two spray guns can be operated without difficulty in maintaining temperature at 160° F and possibly as many as four guns might be attached. Heating medium is steam and the hot lacquer is circulated by means of an air pump.

5. M & E Mfg. Co., Indianapolis, furnishes an electric unit with temperature control fully adjustable to permit setting anywhere from 100 to 200° F. Heating medium is hot water, and lacquer is circulated by either an air or electric pump, whichever is preferred. Circulating system is tin-lined throughout to prevent discoloration of the lacquer. Capacity is sufficient to permit operation of up to three guns, maintaining temperature at a minimum of 150° F. Equipment is mounted on a movable platform.

6. Svenska M. A. Grief, Sweden, through distributor Douglas Wilson & Co. Inc., New York, manufactures a small heat exchanger which can be attached to the spray gun. Heating medium is air which is heated by an electric element. The design calls for the heated air to be used to atomize the lacquer being sprayed. A small amount of air is bled constantly through the gun, even when no lacquer is being sprayed. Hot lacquer can be delivered to the gun without need of a circulating system, making the equipment relatively easy to clean, always a troublesome problem in any type of spraying operation, hot or otherwise.

7. Industrial Sales Co. of California, Pasadena, Calif., supplies a heating unit comprising a hermetically sealed and evacuated heat exchanger which has been applied to various models ranging in capacities from 6 to 25 gallons per hour. Standard types will raise fluid temperature to 100° F at any rate of flow, up to the rated capacity of the heater. Heat is provided by a Nichrome blanket element. Circulation of hot lacquer is by means of an air motor or explosion-proof electric motor. A movable platform is used.

8. Reliable Products Mfg. Co., Brooklyn, N. Y., manufactures an electrical unit with the coil containing the lacquer immersed in a heat-transfer liquid



Temperatures found during spraying of lacquer at 162 °F, using room temperature air (72 °F) for atomization. Lacquer as deposited on the target 8 inches from the gun is at approximately room temperature, greatly reducing chances of blushing during application

which prevents direct contact with the heating unit. Present units are built with or without air heating coils, and special designs with capacities of up to 500 gallons per hour, steam or electric operated or in combination, are available.

The hot-spray process originally was patented by Commercial Solvents Corp. About a year ago this company dedicated the patent to the entire paint, varnish and lacquer industry without cost or restriction. Hercules Powder Co., Wilmington, Del., manufacturer of nitrocellulose ingredients from which lacquers are produced, has been effectively carrying the story of hot-spray lacquer to industry, and evaluates the positive side of the case for hot spraying approximately this way:

Solids are higher and the thickness obtained for each pass is greater. A lacquer which at room temperature cannot be sprayed above 21 per cent solids, can be sprayed at 30 per cent solids when heated to 150-160° F at the gun.

Solvent waste is lower. A typical lacquer at 21 per cent solids uses 3.76 pounds of solvent to lay down 1 pound of solids. At 30 per cent solids only 2.33 pounds of solvent are used per pound of solids.

Coverage per gallon is increased. If 1 gallon of lacquer, applied cold at 21 per cent solids, will finish 100 units, then 1 gallon of the lacquer spray hot with 30 per cent solids will finish 143 units, with the same film thickness. It must also be appreciated that the hot lacquer formulation is somewhat more expensive than the conventional cold lacquer mix, because of the higher solids content.

Fewer coats are needed. Experience seems to indicate that by spraying hot, at the higher solids content, two coats will be the equivalent of three sprayed cold. This, in effect, means an increase in the plant finishing capacity of 33⅓ per cent or, in the case of one hot coat replacing two cold, a 50 per cent increase, in terms of floor space, spray guns, operators, compressor capacity, etc.

Finish has better flowout, less tendency to sag. Evidence indicates that heavy flims flow out better than thin ones, and also are less inclined to sag. For example, one lacquer applied to a vertical surface at room temperature sagged when a film thicker than 0.001-inch was applied. The same lacquer solids, applied at 160° F in a hot-spray solvent formulation, did not sag when 0.002-inch of film was applied.

Blushing is eliminated. In some areas, blushing is a major problem, particularly during humid weather. Moisture condenses on freshly sprayed lacquer droplets as they are cooled by rapid evaporation of the solvent and clouds the film. With hot spraying, it is virtually impossible to create a blushing condition.

Toughness and cold-check resistance are better. When lacquers are formulated specifically for high-solids application, it is possible to use higher viscosity materials, thus providing films with greater cold-check resistance, tensile strength and toughness, at no loss of solids.

Contact Temperature 20° Higher—Lacquer applied at 160° F has been found to be at room temperature when sprayed on an object 8 inches from the spray gun. This is in contrast to regular lacquers, which

Application of aircraft finishes by the hot spray method is broadening. Here is a typical operation at Douglas Aircraft Co. where a wing section is being processed. Photo courtesy Hercules Powder Co.

are approximately 20° F below room temperature 8 inches from the gun. Laboratory tests have shown that hot air is not beneficial in applying hot lacquer.

The nonvolatile ingredients of a hot lacquer need be no different than in a room-temperature material. Solvents, however, must be changed. To spray at 160° F it is advisable to eliminate fast-evaporating solvents such as acetone, ethyl acetate, methyl alcohol, etc., from the blend. Hot lacquers usually contain 40-55 per cent more solids than room temperature lacquers. They must be kept free from highly reactive pigments and dyes which are not heat stable. Many of the advantages of spraying nitrocellulose lacquers at elevated temperatures can be translated to hot lacquers based on ethyl cellulose, cellulose acetate, high-viscocity vinyl resins or chlorinated rubber.

An important attribute of lacquer in the light of today's supply conditions is its availability. Large-scale production capacity is available, not only for the finished lacquers, but also for nitrocellulose and the other ingredients. In addition, lacquers are not tied to any one critical material. Coatings of comparable quality can be formulated from a wide variety of plasticizers, resins and solvents. If, in total mobilization, certain materials should become more critically needed for something other than coatings, alternates are available without sacrifice of quality.

Phthalic anhydride is a resin material for enamels and laquers which is in extremely short supply today and, in spite of expanded plant facilities for its production, will remain short of expected demand through 1952. It is required in many important military applications other than protective coatings. However, the supply of nitrocelulose is ample and there is no shortage of its basic raw materials.

By GUY HUBBARD
Machine Tool Editor

Seen and Heard in The Machinery Field

STREAMLINED TOOL SHOPS: At the sixth national meeting of National Tool & Die Manufacturers Association in St. Louis, I heard a lot of discussion of ways and means of attracting and holding the fine craftsmen who form the backbone of this key industry.

Of the many suggestions made, the one which impressed me most was that tool and die shops should be made superlatively good places in which to work, if good men are to be expected to gravitate to them instead of away from them. That suggestion impressed me because lately I have visited several shops which acted upon it. They represent practical streamlining which promotes smooth customer relations as well as smooth industrial relations.

Some of these plants are brand new, both as to buildings and as to equipment. In such cases the streamlining job has been largely a matter of good industrial architecture keyed in with good industrial engineering—plus ability and money to get the latest new machines and tools. Others are old plants which have been refurbished and rearranged—and the equipment rebuilt and retooled as far as possible in line with modern standards. This requires even more ingenuity than the setting up of an entirely new establishment.

It is not enough merely to build and re-equip or to rebuild and recondition. Having done those things, rigid rules of plant housekeeping must be established and maintained so there will be no relapse into the conditions of the traditional dirty machine shop. On the face of it, all this may seem costly. In the long pull, however, money so spent will be returned manyfold in the form of reduction in accidents, better work, and less spoilage, reduced labor turnover and favorable impressions on customers and prospects.

MACHINES BEHIND THE GUNS: Despite predictions to the contrary, artillery continues to be a decisive factor in modern warfare. That is borne out by recently released news photos showing acres of empty shell cases collected in Korea—presumably for reloading.

Unlike these shell cases, projectiles are expendable items. Behind the thousands of guns in the field there must be shell-making machinery capable of keeping up the supply of live ammunition. Any time a cold war grows hot, that means a lot of machine tools.

During World War II, untold thousands of standard engine lathes, critically needed on other more complicated defense work, were tied up on shell machining. Special purpose machines eased the situation somewhat but to nowhere near the extent that should have been the case.

Now that our stockpile of live ammunition rapidly is being depleted by heavy artillery action in Korea, shell production looms up again as an immediate and critical phase of defense work. At this time, when standard machines are harder to come by and more critically needed than at any time during World War II, it will indeed be too bad if better advantage is not taken of special purpose shell lathes than was true between 1941 and 1945.

A typical shell lathe is designed simply and solely for top speed machining—turning, contouring, grooving and end-facing—of a particular caliber of shell from forged or sawed steel blanks. It is a rugged, powerful and reasonably accurate machine from which all mechanical and artistic frills have been eliminated.

It can be mass-produced in shops other than regular machine tool plants, by workmen who are not regular machine tool builders. It can be operated by relatively unskilled help—including women. It has no possible use other than for making shells. Therefore it will not glut the peacetime machine tool market if and when we ever again have one.

In other words, if more heat immediately is put on the shell lathe program, some of the heat can be taken off the inefficient subcontracting programs and uneconomic plant expansion programs with which many of our regular machine tool builders now are being threatened.

IMPROVISATION: In normal times it is customary in American mass production industries to install machine tools selected or designed especially to suit particular jobs. That has proved to be a remarkably successful policy on peacetime production and would be equally so on defense work—if such highly selective machines could be obtained. Unfortunately, delivery dates range from six months to two years. History is being made much too fast to allow waiting that long.

Therefore, improvisation—not always the best way in peacetime—is the order of the day in many defense plants. Some of the best places to see successful operations carried out in unusual machines are in machine tool plants.

Every machine tool builder naturally likes to make maximum use of machines of his own make. For that reason it is common to find lathes set up as precision boring machines, in lathe plants; planers utilized on work which ordinarily would be milled, in plants building planers; and grinders doing work which ordinarily would be turned in plants building cylindrical grinders.

These setups involve ingenious fixtures and tooling which make the respective machines highly effective for the unusual jobs to which they are applied. Contractors and subcontractors of war work might do well to travel around among the machine tool plants. They should study some of these ingenious and unusual setups before crying too copiously in their beer because they cannot immediately procure exactly the machines specified in the book for work they have undertaken. What machine tool builders already have done, they certainly can do at this time when American ingenuity is the hope of the western world.

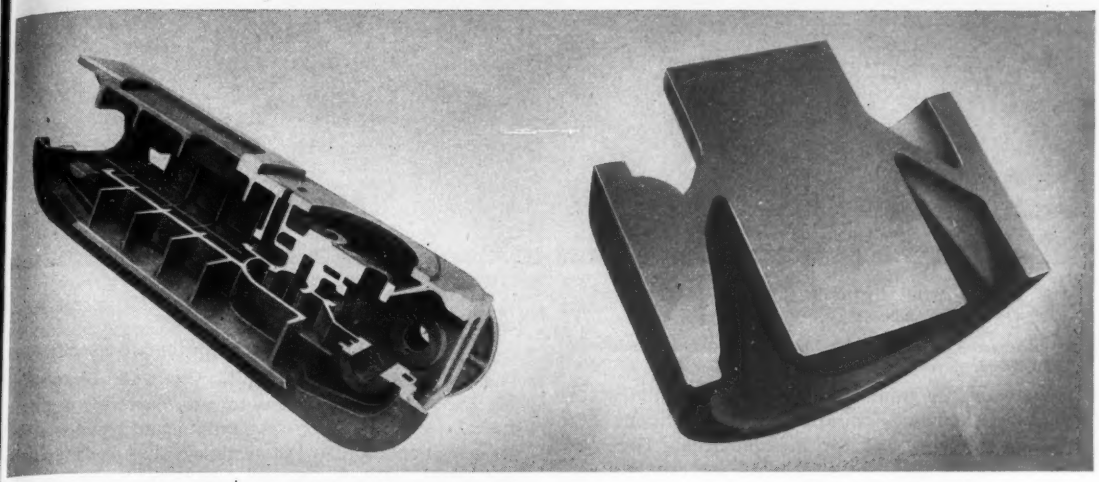


Fig. 1—Left, section through a vehicle casing of a machine cast in Meehanite metal with a tensile strength of over 55,000 psi despite intricacy of design. Right, complex shape demonstrates uniform solidity despite wide variation in thickness of adjoining sections

By C. R. AUSTIN
Assistant to President
Meehanite Metal Corp.
New Rochelle, N. Y.

Casting Soundness Can Be Controlled

Design and materials engineers, working closely with foundry technicians can reduce shrinks and general porosity in castings, saving time, labor and materials and eliminating the hazards of using defective castings

CONTROL of casting soundness and casting imperfections belongs primarily to the foundry manufacturing the castings. Persistence of defects, however, including shrinks and general porosity has stimulated activity in the field of casting impregnation methods, particularly in products subjected to fluid pressures.

Tests under fluid pressure are only one phase in which the casting consumer industry encounters delay and expense in attempting to patch up a product so that it will adequately serve its functional purpose. Shrinks and porosity lead to such problems as lowering assumed or specified engineering properties on which the materials engineer has based his design. Casting unsoundness has also been the cause of much lost time and casting rejects in the machine shop.

Many Causes for Defects — There are numerous causes for the defects termed casting porosity, including shrinkage and gasified metal. But in good foundry practice most porosity defects can probably be traced to the simple fact that any given amount of molten metal poured into some form occupies less volume when completely solid. In nonferrous metals and in steel, the volume shrinkage in the liquid-solid change must be compensated for entirely by feed metal, if casting soundness is to be assured.

This is a relatively simple problem when design permits progressive solidification to proceed from lightest to heaviest sections, with large risers or feeder heads suitably located on the last sections to solidify. Demands on design frequently prohibit this simplification of form, hence porosity and shrinks tend to be accepted as inevitable.

Founders of iron castings are in a particularly favorable position in the production of porous-free castings. The liquid-solid shrinkage is largely compensated for by the separation of a low density-high volume constituent, graphite, during the range of

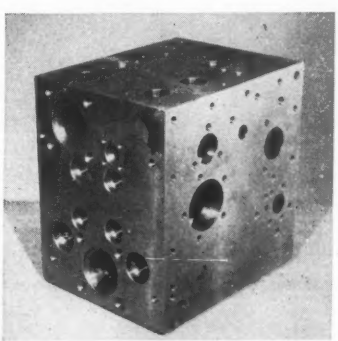


Fig. 2 (left)—Valve body machined from a solid block of Meehanite which must be cast completely free of defects, sponginess or porosity

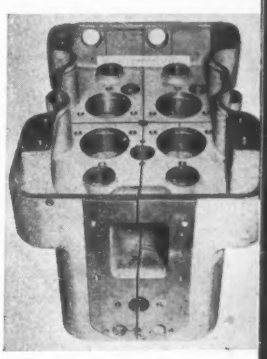


Fig. 3 (right)—Large four-valve diesel engine head cast in Meehanite. Sections of the casting range from ¼-inch in the frame head passages and cylinder walls to 2 inches on the firing face of the cylinder head

Fig. 4—This small hydraulic cylinder casting was tested successfully at 32,000 psi

temperature fall from the liquid to the solid state. This graphite has a specific gravity of about 2.25 as compared with 7.85 for metallic iron. Thus the graphite may occupy some 10 to 11 per cent, by volume, of the mass of the solid casting and the total volume of the solid casting may approximate the initial volume of the liquid metal poured into the mold.

Consult the Designer—Considerable skill is still demanded on the part of the foundry technologist to assure adequate flow of liquid metal to all sections of the castings by suitable gating and risering systems. Much can be accomplished from consultation with the design engineer so that sound principles of casting design, as influenced by foundry practice, can be guaranteed.

For several years these matters have been cardinal principles in the manufacture of Meehanite castings. The materials engineer has at his command castings with:

1. Freedom from porosity.
2. Uniformity of structure and properties despite section variation.
3. Mechanical properties according to specification.

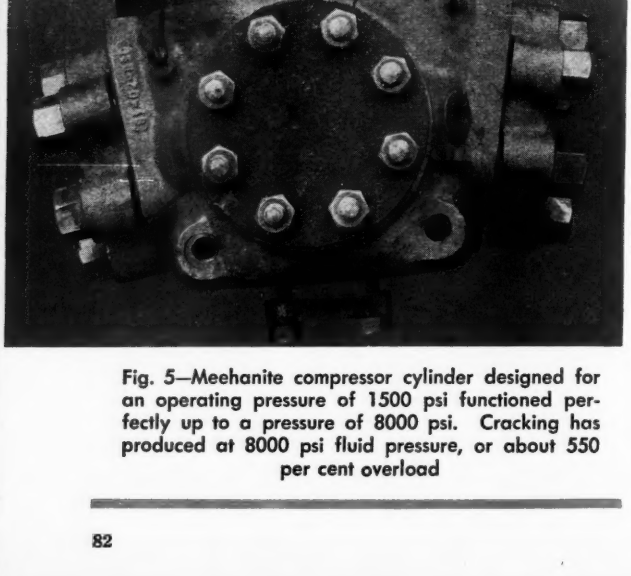


Fig. 5—Meehanite compressor cylinder designed for an operating pressure of 1500 psi functioned perfectly up to a pressure of 8000 psi. Cracking has produced at 8000 psi fluid pressure, or about 550 per cent overload

Factors which have led to the wide demand for Meehanite castings by design and materials engineers include control of the constitution and process wedge values in relation to the section of the castings to be made and their effect on what has been termed solidity penetration of the iron. These matters are entirely the concern of the foundry technologists and relate to casting manufacture, but they are of vital importance to the consumer in terms of the functional operation of the material.

Results Impressive—Accordingly, a few examples taken from a variety of industrial applications are included to portray the effectiveness and results of modern foundry technology from a variety of actual service records.

The two castings in Fig. 1 illustrate uniform solidity in two widely different types of castings. The picture on the left is a section through a vehicle casing of a machine cast in Meehanite metal with a tensile strength of over 55,000 psi despite intricacy of design. On the right the complex shape demonstrates uniform solidity despite the wide variation in thickness of adjoining sections.

Fig. 2 shows a valve body machined from a solid 12 inch side block of Meehanite metal. This part exemplifies the success in overcoming mass influence in terms of complete freedom from casting defects, sponginess or porosity. This unit was formerly made in steel forgings. Any unsoundness or trace of sponginess in the casting, revealed on machining would be an immediate cause for rejection.

An interesting example where density and solidity are paramount is illustrated in Fig. 3 which shows a large four-valve diesel engine head cast in Meehanite metal. This casting contains sections ranging from ¼ inch in the frame head passages and cylinder walls to 2 inches on the firing face of the cylinder head. All passageways have to be watertight with close tolerances maintained.

The small hydraulic cylinder Meehanite casting reproduced in Fig. 4 was given a test of 32,000 pounds and passed inspection. Incidentally, this small unit is required for a 3-5 ton capacity jack with a double action twin piston pump.

Another example is a Meehanite compressor cylinder designed for an operating pressure of 1500 psi but functioning perfectly up to a pressure of 8000 psi. The cracking produced at 8000 psi fluid pressure or about 550 per cent overload can be seen in Fig. 5.

By R. F. ONSRUD
Designer and General Manager
Onsrud Machine Works Inc.
Chicago

Skin Milling Machine

CUTS WING SECTIONS FASTER

SKINS and structures used in high speed aircraft are machined efficiently on a new power router—skin mill built by Onsrud Machine Works. Integrally stiffened wing skins require exceptional metal removal to form ribs and stiffening sections for intra-wing members while providing a smooth exterior airfoil surface. As much as 85 to 90 per cent of the work piece must be removed in chips at the same time producing the specifications to micrometer measurements.

Since the metal removal of stressed skins consists of bottom milling or piercing with end mill cutters, quantity production of aircraft demands something faster than the hand fed arm router or tracer controlled mills. In either case the horsepower was too limited or the feed too slow.

Works Like Shaper—Using a new twist to woodworking shaper design principles, the so-called Invomill cuts any configuration, internally or externally, will bottom mill or pierce in materials up to 2 inches thick. It is power fed and guided to a template. Operation is simple and semiautomatic in that the accuracy is determined by the template rather than the operator's ability. Cuts have been made within plus or minus 0.001-inch. Also heavy cutting has been produced.

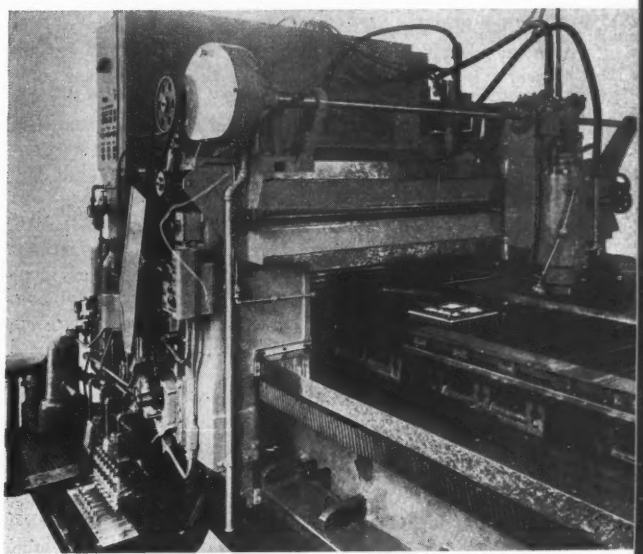
One of its novel features is ability to change or reverse direction without stoppage or pause whether the design requires internal or external corners. In either case a uniform rate of speed is maintained, and there is no danger of an inside nick or external bulb.

A 30 hp, 15,000 rpm high cycle, direct motor driven spindle is mounted within a 360-degree rotating unit, which in turn is mounted within a cross slide and a gantry type carriage. The motor unit is pivot mounted within the drum, being pressure loaded; its guide collar to template. In operation, the operator is seated and rides with the carriage. Through two control levers . . . one for the rotary movement and the other a joy-stick for the combined movement of carriage and cross slide . . . he controls the feed manually but only approximately to template-shape by means of a center indicator. His accuracy need be only within 1 inch plus or minus without affecting the micrometer accuracy of the completed work.

Path Limited—G-E amplidyne motor controls are so arranged that all provide forward and reverse with infinite range of speeds from 0 to maximum which are approximately 140 inches per minute. Should a novice operator get off the beam of his 2-inch wide path, signal lights will flash. He may then correct the position or continue. Safety devices will stop the machine if he enters beyond a 4-inch path (plus or minus 2 inches). Foot-operated air lifts are provided for the rise and fall movements of the cutterhead and also the template follower.

For the production of tapered skins on sheets or integrally stiffened plates, the unit has a 40-hp motor (up to 100 hp can be provided) which mills tapers transversely or longitudinally; and with suitable controls, a combination of both. Sine tables are unnecessary since the motor spindle is adjustable to the perpendicular of the taper. Transverse taper is obtained by the setting of a slide rail and the longitudinal taper through a vertical feed actuated from the carriage movement. Surface finishes of 6 to 10 M.I.S. are obtained.

The bed is furnished in 15-foot long sections with ground table plates having a working area 60 inches wide; thus the machine may be of any length and have two or more carriages. Travel type carriage eliminates superfluous bed and floor area greatly reducing the amount of iron and steel generally used in machines for milling nonferrous metals. The cutter coolant is provided for by a centrifugal pump mounted on the carriage with a return receptable built into the bed. Screw conveyors for chip removal are also provided in the bed. Table sections are grilled to provide a gravity disposal of chips and coolant.



Onsrud Invomill operates on principle used on automatic woodworking shapers. The unit cuts any configuration, internally or externally, will bottom mill or pierce in materials up to 2 inches thick

By C. B. POST
Chief Metallurgist
Carpenter Steel Co.
Reading, Pa.

TOOL STEELS

. . . Developed for Varied Applications

Improved manufacturing techniques in tool steel industry lead to production of steels of high impact strength, high fatigue resistance, high hardness, resistance to wear and abrasion and ability to heat treat for desired properties

PROPERTIES of tool steel depend upon many variables in addition to the analysis. This is one of the main distinctions which must be borne in mind when considering tool steels and comparing them with construction steels. The tool steel industry is faced with the development of new steels and the improvement of older grades of steel so that steels will keep abreast of engineering needs in the tool and die field. What was considered as tool steel 50 years ago for hand tools such as files, hatchets, axes and cutlery, can now be considered as tonnage mill products, or high production items for the tool steel industry.

During the last 50 years, the range of tool steels available for cutting, shaping, and forming of metals and other materials increased something like one-hundred-fold. One of the tasks of the tool steel industry over the past 20 years has been to classify this mass of "alloy tool steels" into a workable system of tool steel selection, based upon the specific job the tool steel was expected to do. In this classification it is sometimes necessary to differentiate between "die steels" and "tool steels," even though both names apply to steel made by the tool steel industry.

Classification—The base for most systems of die steel classification is the 1.00/1.10 per cent carbon water hardening tool steel since this is the most common of all the die steels. Some steels have been developed which show greater wear resistance than the 1.10 per cent carbon tool steel such as water hardening steel containing 1.30 per cent carbon and 3.50 per cent tungsten. Several other steels have been commonly used where greater toughness or resistance to impact is desired than in the 1.10 per cent carbon steel, such as a water hardening steel containing 0.50 per cent carbon, 1.00 per cent silicon, 0.50 per cent molybdenum or 0.60 per cent carbon, 2.00 per cent silicon, 1.00 per cent manganese. These steels get into the range of steels commonly used for chisels and other chipping tools where resistance to spalling and chipping is important.

Oil hardening decreases quenching hazards, decreases internal stress on hardening, and in general leads to much smaller size changes after hardening and drawing than water quenching, but requires that some alloying elements be present to enable the steel to be hardened by oil quenching.

The starting point for the oil hardening classification can be a grade of steel containing 0.90 per cent carbon, 1.75 per cent manganese steel (with or without small quantities of chromium and tungsten) which is oil hardening, easy to machine because of ease in annealing, and will show a small size change after oil quenching. Among the oil hardening steels, some steels will show a greater resistance to wear than the 0.90 per cent carbon, 1.75 per cent manganese steel. An example of such a steel would be one containing 2.10 per cent carbon, 12.00 per cent chromium with or without small percentages of molybdenum, nickel or cobalt. This is the familiar high-carbon high-chromium analysis which is popular for lamination dies and other stamping dies where resistance to wear on the cutting edge is important.

In the same way, steels can be found which will be considerably tougher than the 0.90 per cent carbon, 1.75 per cent manganese steel. An example of such a steel would be a 0.60 per cent carbon, 2.00 per cent silicon, 1.00 per cent manganese chisel steel which would be oil hardening, or a steel containing 0.70 per cent carbon, 1.00 per cent chromium and 1.50 per cent nickel. Here again these two would be oil hardening and would have the main property of being considerably tougher than the standard oil hardening steel mentioned formerly.

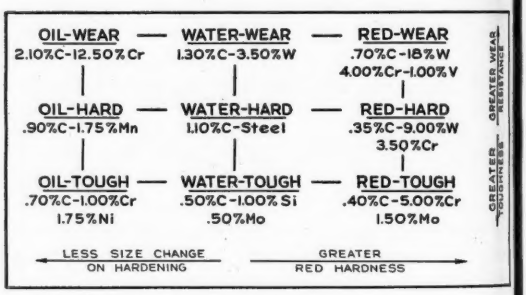


Fig. 1—Classification of die steels

Hot Working Applications—In the same way, steels can be sought which would have greater hot hardness than the 1.10 per cent carbon water hardening steel, or the 0.90 per cent carbon, 1.75 per cent manganese steel. Such steels would be commonly used for hot working applications, such as extrusion dies, drop forging dies, Ajax upsetter dies in hot working, and

From a paper presented at the 1951 Philadelphia regional meeting of the American Iron and Steel Institute

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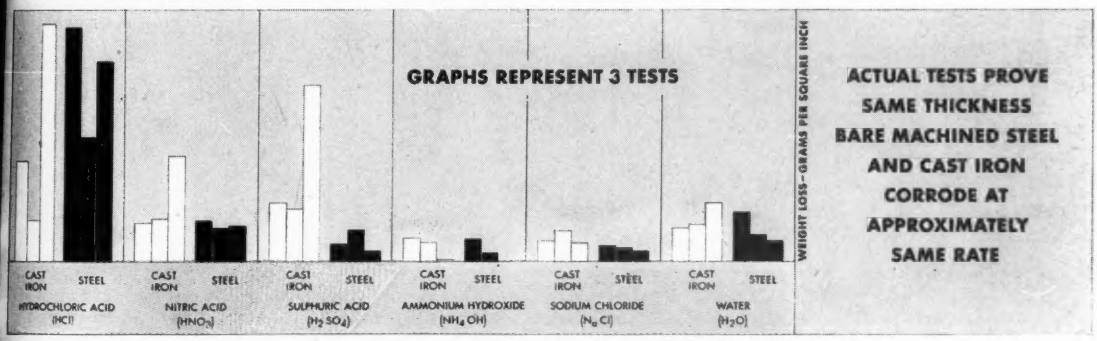
GRAPHS REPRESENT 3 TESTS
WEIGHT LOSS - GRAMS PER SQUARE INCH
CAST IRON
STEEL
HYDROCHLORIC ACID (HCl)
NITRIC ACID (HNO_3)
SULPHURIC ACID (H_2SO_4)
AMMONIUM HYDROXIDE (NH_4OH)
SODIUM CHLORIDE (N_aCl)
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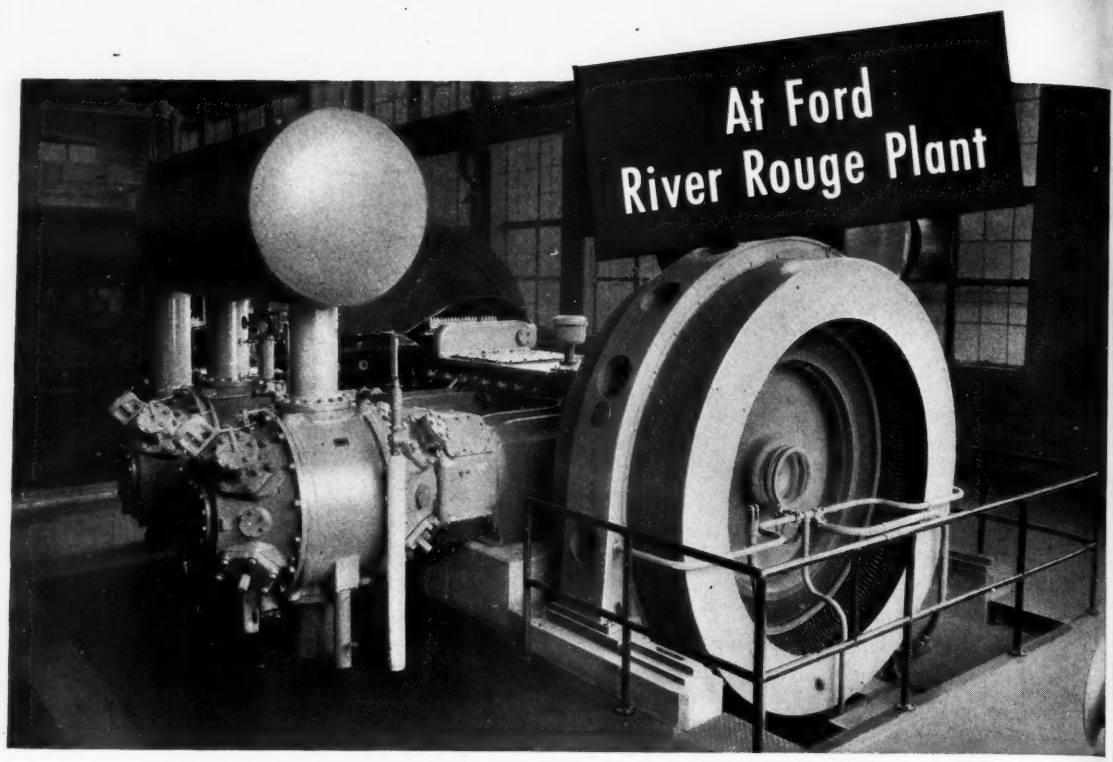

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other applications where heat is involved so that the temper would be drawn out of the ordinary oil or water hardening steels mentioned previously. The first steel that comes to mind would be the 0.35 per cent carbon, 8.00/10.00 per cent tungsten, 3.50 per cent chromium steel which is widely used as a hot work steel for extrusion dies, and other forging applications.

Here again, a system of classification can be made to indicate steels which would be somewhat tougher than this 8.00/10.00 per cent tungsten grade and which would be more resistant to impact chipping and the like on forging. Such a steel would be the 0.40 per cent carbon, 5.00 per cent chromium, 1.50 per cent molybdenum steel commmonly used throughout the die casting field, extrusion field, and other severe upsetting operations where resistance to breakage

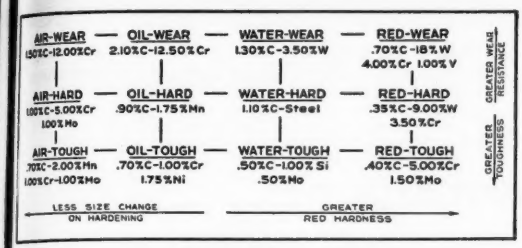


Fig. 2—Matched die steels

would be greater than the 8.00/10.00 per cent tungsten grade. Also, a more wear resistant steel than the 0.35 per cent carbon, 9.00 per cent tungsten steel brings us into the field of so-called high-speed steels represented by the familiar 0.70 per cent carbon, 18.00 per cent tungsten, 4.00 per cent chromium, 1.00 per cent vanadium steel and the molybdenum high-speed steels. Such a system of classification of die steels would appear somewhat as that shown in Fig. 1.

Starting with the 1.10 per cent carbon water hardening steel, greater wear resistance will be obtained if one goes north on the diagram and greater toughness will be obtained if one goes south on the diagram. Less size change will be obtained if one goes west on the diagram, and greater red hardness will be obtained if one goes east on the diagram.

Modern tool designers have been called upon to design dies which would have been considered impractical to heat treat not too many years ago. Each tool steel imposes definite limitations on the design and shapes of tools which can be made from it. Important considerations are the size change and the distortion of the steel when quenched to make the tool, and limitations on the size of sections which can be successfully hardened from any one steel. The trend in tool making is to demand tools which involve an extremely intricate design, or a section so unbalanced that even the oil hardening grades of steel will not produce satisfactory results. This trend in tool and die making to demand greater accuracy in hardening with greater freedom from cracking during quenching in intricate sections accounts for the gain in popularity and use of air hardening steels as compared to oil hardening grades for these specialized applications. There is also the application of air hardening tool steels in making large tools which cannot be satisfactorily hardened from oil hardening steels because of hardenability considerations and limitations on oil quenching equipment in handling large and heavy tools.

Air Hardening—Air hardening tool steels were developed to meet the following specialized applications in tool steel designing:

1. The steel should have less distortion in heat treatment than could be obtained with the conventional oil hardening steels.
2. The proposed tool would have extremely intricate sections involving both thin and heavy sections where less cracking hazard and minimum size change are desired after heat treatment.
3. The steel should harden through uniformly in large sections.
4. The size of the tool to be made from the steel would be too large for the oil quenching equipment available and the simple procedure of air quenching would be the logical answer.

An air hardening steel which has won acceptance for general purpose use is a 1.00 per cent carbon, 5.00 per cent chromium, 1.50 per cent molybdenum grade of air hardening steel. This steel will show an exceptionally small size change on air hardening and, because of its air hardening property, will show considerably less cracking on heat treatment than oil or water hardening steels. Proceeding as before to classify these air hardening steels, a steel which will show more abrasion or wear resistance than the conventional 1.00 per cent carbon, 5.00 per cent chromium, 1.50 per cent molybdenum steels, is a steel containing 1.50 per cent carbon, 12.50 per cent chromium, and small amounts of vanadium and molybdenum.

To find a tougher grade of air hardening tool steel, we developed a grade of steel containing 0.70 per cent carbon, 2.00 per cent manganese, 1.00 per cent

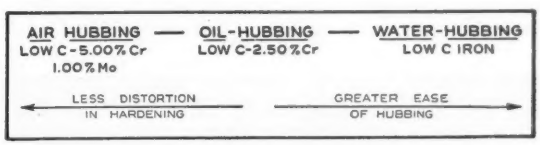


Fig. 3—Matched hubbing steels

chromium and 1.00 per cent molybdenum. This is an extremely deep hardening air hardening steel and can be air hardened from temperatures of about 1550°F. The low alloy content of the 0.60 per cent to 0.80 per cent carbon, 2.00 per cent manganese, 1.00 per cent chromium, 1.00 per cent molybdenum steel leads to ease in forging large and intricate sections and ease of handling in heat treatment because of its lower hardening temperature. This steel shows greater resistance to impact shock, ease of forging, and the minimum of size change and distortion in the air hardening group.

Referring to Fig. 1, the air hardening steel classification can be put onto this diagram and is shown in Fig. 2. The air hardening steels naturally fall to the west of the oil hardening steels because of their less size change on hardening.

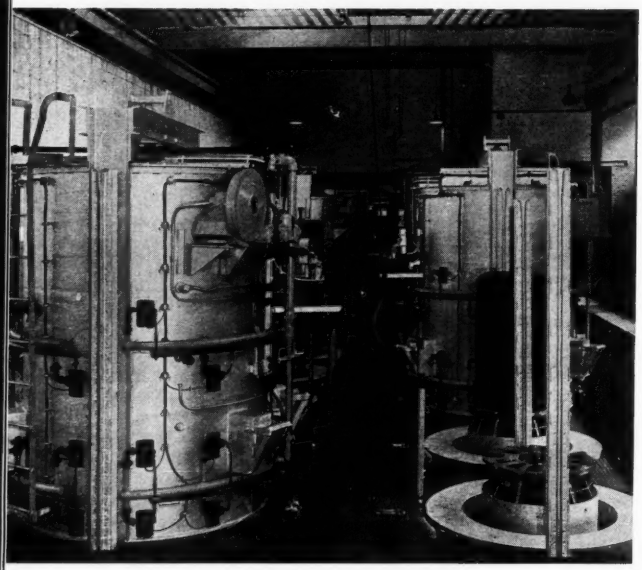
High-Speed Steel—In the case of tool steels used

(*Please turn to page* 98)

Two-high 3-stand tandem cold reduction mill installation for "tailoring" steel to exact customer specifications

Steel Warehouse Installs Cold Reduction Strip Mill

The Chicago area steel distributor, Korhummel-Heffron & Preiss, believes that the warehouse industry must continually be seeking ways to further service their customers. This new rolling mill facility is a step in that direction



General view of the warehouse's bright annealing facilities for strip and round-edge flat wire

STRIP STEEL "tailored" to customer's specific requirements—an innovation in steel warehousing—is being produced at the Evanston, Ill., plant of Korhummel, Heffron & Preiss Steel Co. This is particularly important in light of today's steel shortage because stock can be re-rolled into useful sizes and tempers from otherwise dead inventory.

Rolling facilities consist of a two-high 700 hp, 3-stand tandem, 16-inch electrically operated cold reducing mill. Facilities are also available for bright annealing and pickling the steel coils. Capacity is about 2000 tons per month.

Hot rolled coils move by crane from the storage bays, through the scale breaker, into the coil pickling department. In the pickling operation, coils are loosened and revolved in a reverse direction to the winding so that all area of the steel strip receives the proper treatment during pickling, neutralizing and rinsing.

Maximum Reduction of 50% — The mill's three stands reduce the steel up to a maximum of 50 per cent in thickness. The material is re-coiled at the outlet and if of the proper gage and temper, moves to the slitting bay where a battery of 14 machines cut the steel to customer's ordered widths.

In many instances, however, material will require bright annealing before and after passing through the mill, especially where more than one mill pass is necessary to obtain the required gage or temper. For this reason, specially designed annealing furnaces have been installed by Continental Industrial Engineers Inc. of Chicago. This equipment occupying a floor space of about 23 by 60 feet, consists of four

Here's "on the job" proof of furnace savings with

B&W ALLMUL FIREBRICK

BILLET HEATING FURNACE

"ALLMUL cost half as much!"

A builder of billet heating furnaces used an expensive electrically-fused mullite refractory in the piers and baffles as well as for the arches in the discharge end of the flue. Reason? Severe operating conditions at these points. Tests of B&W Allmul proved it withstood high temperatures equally well . . . cost approximately half as much. Result? Allmul is now standard for these locations.

BUTT WELDING FURNACE

"39 weeks instead of 6 weeks!"

Semi-mullite brick bungs in the hottest part of a butt welding furnace spalled badly after six weeks. Allmul bungs in the same location were still going strong after *39 weeks*—in better condition than the semi-mullite bungs after six weeks. *Yet Allmul cost little more than the original semi-mullite refractory.* Allmul is now used in uptake arches, uptake side walls and crossovers. Customer has ordered 30 carloads to date.

CUPOLA FRONT-SLAGGER

"ALLMUL has 6 times the life plus . . ."

Replacing super-duty firebrick in a cupola front-slagger of a malleable duplexing operation three times a week was an expensive chore. B&W Allmul in the same location lasts approximately two weeks . . . *six times as long.* Costs drop, too, because of savings due to less frequent relining.

What's behind the remarkable, money-saving performance of B&W Allmul Firebrick? The answer lies in its low first cost for a fused mullite brick and unique combination of excellent refractory properties: high hot load strength, high resistance to spalling, good volume stability, a high melting point of 3335F. Bulletin R-29 gives all the facts on Allmul. Write for your copy.

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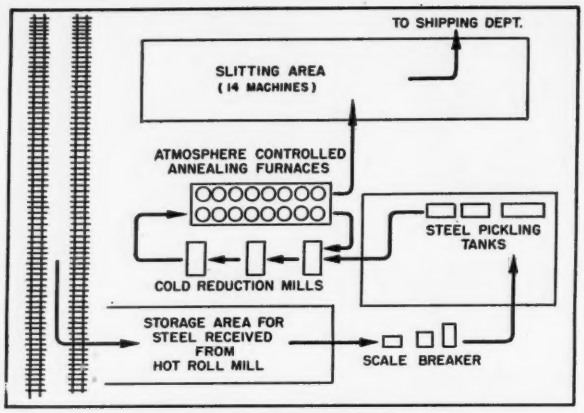


Plan view of K-H&P's layout for pickling, rolling, annealing and slitting flat rolled steel. Note the smooth, efficient flow of material throughout the production cycle

"top hat" refractory-lined annealing furnaces, 18 alloy inner hoods and 16 alloy steel bases.

Annealing Procedure—During annealing operations, four bases are engaged in loading, four heating, four cooling and four unloading. In the loading operation, the coils on four alloy bases are covered with an inner hood, the hood being closed at the bottom with a water-cooled oil seal. A Continental inert-gas generator delivers a carefully controlled gas atmosphere into the hood, the gas being circulated by fans built into the bases so as to assure clean, scale-free surfaces on strip being processed.

A cylindrical "top hat" is then lowered onto the base and its inside temperature raised to the proper degree. The furnace builder also designed the gas system for producing propane used to fire the furnaces. The annealing cycle requires about 56 hours. Coils having been properly "soaked", the "top hats" are lifted off by suitable cranes and immediately lowered over four other bases, which have been previously loaded and are ready for their turn in the annealing cycle.

Annealed charges remaining under the hoods continue to receive inert gas till the temperature has dropped to approximately 500°F, temperature depending upon type of steel being annealed. Inert gas for the hoods must be "scrubbed;" therefore, the propane gas is led through the generator combustion chamber, a refrigerating unit and a scrubbing tank to remove all moisture.

Seamless Tubing Re-Drawn—Round edge flat wire in coils will also be processed with this equipment. It is proposed to add one additional furnace for annealing steel in straight lengths. The warehouse also has at hand facilities for re-drawing seamless tubing to produce special outside diameters and wall thicknesses specified by their customers. They do not produce the tubing but secure it from integrated mills as partially processed, hot finished or cold drawn tubular blanks.

They will use their new rolling capacity to supplement supplies from regular mill sources and to produce steel to standard as well as intermediate tempers and tolerances.

Bottom Poured Ingots Discussed

Molten steel, normally poured into upright molds may also be forced upwards from the bottom, T. E. Watson, director of research, Lukens Steel Co., Coatesville, Pa., told the Philadelphia regional technical meeting of American Iron & Steel Institute. In the latter case, he said, when the steel becomes solid, the surface quality is so good it can be rolled directly into plates with just one mill operation.

Normal sized bottom poured ingots yield an average of about 5 per cent more plates than the conventional ingots which are poured from the top, Mr. Watson said. The good surface quality eliminates the need for a slabbing mill, and the overall quality of the steel is equally as good as that obtained in top pouring practice.

He said that since a slabbing mill is not used to reduce bottom poured ingots, every ingot must be tailor-made to obtain the type plate desired. Thus a wide variety of mold sizes is required. Bottom pouring practice serves a very useful purpose in the steel industry, particularly to the small producers, in making good quality ingots for the manufacture of steel plates. "Furthermore, it is the best practice for making small ingots," Mr. Watson said. Although there are hazards connected with bottom pouring, with the necessary controls the rewards that are received are ample to justify its use in the manufacture of steel plates.

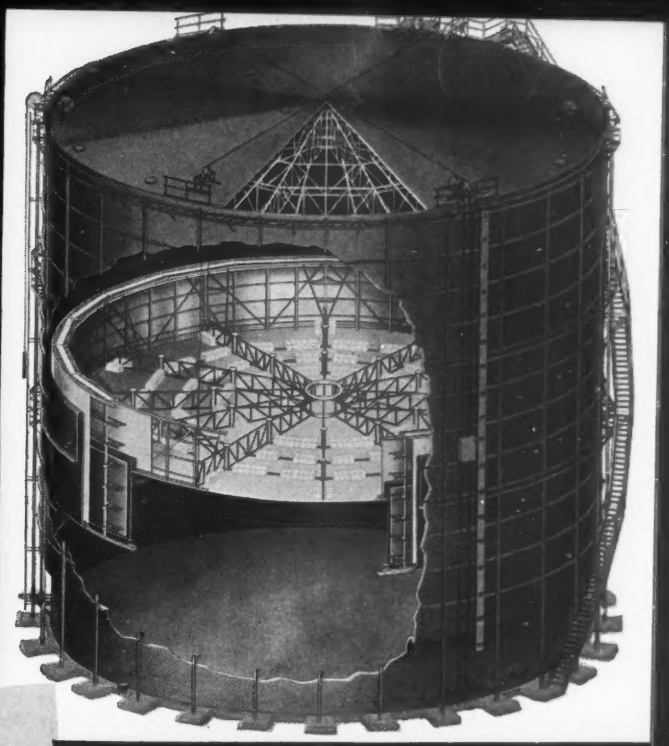
Big Gain Made in Boring Job

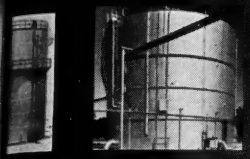
As much as 129 per cent production increase is reported by Roney Inc., Inglewood, Calif., aircraft subcontractor, on the boring of rocket-housing tubes with the Hydro-Borer made by Hydro-Borer Co., Inglewood. Production rate on one operation was stepped up from 82 to 112 per hour. Another was boosted from 27 to 62 per hour.

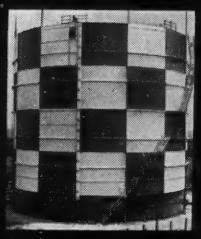
Job specifications called for the first operation to bore to a depth of 0.810 ±0.005 with an ID of 2.937 ±0.0005-inch. The second operation was to bore the opposite end to a depth of 2.190 ±0.005 to an ID of 2.937 ±0.0005-inch. The material was 61ST-6AL aluminum tubing, 3¼-inch OD x 0.187-inch wall x 13.120 inches long. A 40 microinch finish was required.

Previous method of handling these tubes produced an out of round condition in the bore and ID and the 40 microinch finish was not consistently held. This was eliminated on the Hydro-Borer which held absolute concentricity and produced a finish of 30 microinches with tolerances of ±0.0003-inch.

Machine is set up to feed to adjustable stops and return automatically. Work is held stationary and the boring tool moves into the work hydraulically at a predetermined and constant rate of feed. Work holders were finished on the machine with fixtures located on the 2-inch OD front bearing to insure accuracy.







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See American Gas Association Builder's Committee Report (May, 1951)

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Loading, Unloading Costs Slashed 75 Per Cent

By G. R. REYNOLDS
Superintendent, United Stove Co.
Ypsilanti, Mich.

FOR YEARS United Stove Co. has been bothered by a problem in shipping and receiving operations which is probably typical of many companies throughout the country. The problem is one of getting loads into and out of highway trucks quickly and economically when plant floor shipping and receiving areas and shop yard are all on the same level.

"Build a ramp and a dock" everyone suggested; and the management agreed that this was the most apparent solution. However, too many other things had to be considered. This construction would be a major project. In addition adjustable dock boards would have to be provided to compensate for different truck-bed levels. The high production rate would suffer because this is the only area available for shipping and receiving operations. This would only be a partial solution, since none of our small fleet of Baker trucks could be spared from their regular in-plant duties.

A special fork truck was decided upon, based on two considerations: First, many of the shipping containers were already equipped with casters. This meant that after the load was lifted up to the truck-bed level it wouldn't be too difficult to push it further into the truck. Not ideal, but a small price to pay. The same operation in reverse would apply for unloading. The load could be pushed to the tail gate where the fork truck would then easily lift it off and lower it to the shop floor level.

Castered skids make loading and unloading by fork truck an easy matter. Since the plant has no docks, these functions must be done from ground level. Loads are placed in the trailer and pushed into position

Second consideration dealt with scrap. This plant manufactures oil stoves, ranges and heaters and does stamping work for the automotive industry—all of which generates large quantities of scrap sheet. Disposal was a problem, but now the special fork truck with the rollover device handles it very well.

Now that the truck has been in operation a while, results are gratifying. Savings of up to 75 per cent are being realized in loading and unloading operations, including scrap handling. Production rate is maintained without the disruptions which construction changes would have meant. This continued high production has kept the new truck busy with no idle time. Objectives have been accomplished at little expense, since the savings are paying for the truck.

Aluminum Brazing Works Smoothly

Mechanical joints at the corners of aluminum windows made by Aluminum Products Co., Houston, were costly and not satisfactory. So the company got together with Smithweld Co., distributor for All-State alloys and fluxes, and redesigned the windows substituting brazing for the mechanical joints. The operation is performed with No. 31 sheet aluminum brazing rod and No. 31 Brazaloy flux with the rod applied at 1050°F.

Brazing work is done by girls with no previous experience at either brazing or welding. The joints turned out not only have the neat appearance that customers want but are as strong as the base metal. Technique is to: Jig the frame parts in place after the braze area is cleaned and degreased (edges do not require beveling); paint wetted flux along the joint; apply heat until flux becomes liquid; and melt off sufficient rod to flow along the joint. After brazing, the windows are cleaned by a 5 minute bath in engraver's nitric acid solution, washed clean in water and sprayed with a clear lacquer.

'1952 Economy in Production'

Tocco Division, Ohio Crankshaft Co., Cleveland, is sponsoring a second contest aimed at uncovering some of the best methods of production economy through use of the division's induction heating equipment. Entrants must describe Tocco installations not reported in previous articles and include photographs or sketches of fixtures and parts named in their studies of increased production—decreased cost.

Rules say contestants should submit at least 250 words on application of equipment for hardening, brazing, soldering, heat treating, annealing, forging or melting. Entries will be received until June 1, 1952, when editors and publishers representing 12 leading business publications will act as judges. First prize will be $1000; second, $700; third, $500; fourth, $400; fifth, $100; and sixth through tenth, $50 each.

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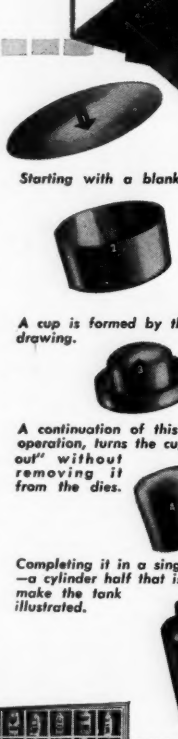

Starting with a blank—

A cup is formed by this initial drawing.

A continuation of this pressing operation, turns the cup "inside out" without removing it from the dies.

Completing it in a single stroke —a cylinder half that is used to make the tank illustrated.

And incidentally, saves time and money for the Scaife Company of Oakmont, Pennsylvania, in their manufacture of formed steel pressure tanks and vessels. Reverse drawing has eliminated intermediate dies, extra annealing ovens, and repetitive handling of parts in the presses . . . parts are uniform in thickness and quality with a reduced number of rejects. The all-hydraulic 750-ton H-P-M press handles these parts at the rate of 100-140 pieces per hour.

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By J. RABINOW
Chief, Electromechanical Fuzing Branch
National Bureau of Standards
Washington

RAPID REVERSAL TECHNIQUE

Applicable for Rolling Mills

ALTHOUGH it is relatively easy to stop an electric motor quickly by the use of electrical or mechanical brakes, rapid starts in either the same or the reverse direction are limited by the low torque that can be obtained by electromagnetic means alone. However, small electric motors may be reversed in 3 to 4 milliseconds using a method developed at the National Bureau of Standards.

In the rapid reversal motor the kinetic energy of the rotor, instead of being dissipated as heat in a brake during deceleration, is converted into potential energy in a spring or other stored energy device, and then is used to accelerate the rotor rapidly in the opposite direction. Although the technique was designed specifically to meet the need for high-speed reversal of magnetic tapes in electronic digital computing machine memories, Harold Hessing, mechanical metallurgy section, National Bureau of Standards, made the interesting suggestion that the technique be applied to the reversing of rolling mills. Measurements on the 2-high 16 x 24-inch reversing mill used at this bureau, show that approximately 3 seconds are needed for stopping the motor, using an eddy-current dissipator brake, and approximately 12 seconds are needed to bring the motor and mill combination up through the normal sequence of starting to operating speed. Preliminary calculations indicate that a mill of this size could be stopped and reversed in approximately 1/5 of a second, using a pneumatic accumulator for a stored energy device.

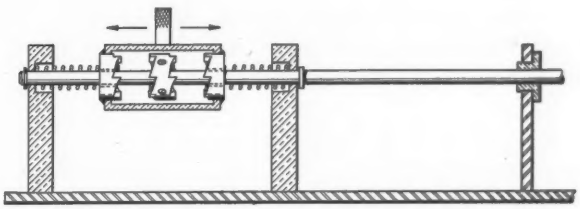
It appears possible that the utilization of such a high-speed reversing device could greatly increase the production from a 2-high mill, and might permit the use of 2-high mills for work which now requires a 3-high mill. It is realized that in order to utilize so rapid a reversal other problems would have to be solved such as: Automatic devices for starting, operating and stopping screwdowns, high-speed billet-handling equipment, etc.

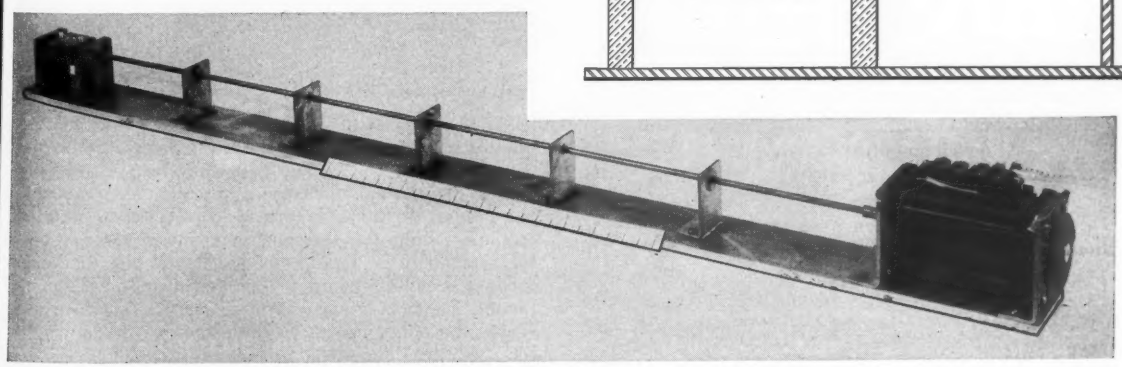
The small low-inertia electric motor as modified at the National Bureau of Standards for quick reversals of 3 to 4 milliseconds is shown in Fig. 1. With the motor operating in either direction, the second of the two positive unidirectional clutches at the left end of the steel torsion bar is engaged, thus stopping the rotation of the adjacent end of the bar. The kinetic energy of the motor is converted into potential energy in the torsion bar by additional rotation of the motor and used to accelerate the motor rapidly in the opposite direction.

A schematic diagram showing the operational details of the two positive unidirectional clutches used in first National Bureau of Standards rapid-reversal motor is shown in Fig. 2. Positioned at one end of the torsion bar opposite that rigidly connected to the motor, one clutch prevents clockwise, and the other counterclockwise rotation. For example, when the shaft is rotating in a counterclockwise direction (observer at the right), the clutch housing is forced quickly to the right engaging the stationary clutch, left, and the rotating member (center of clutch housing). The kinetic energy of the rotor is thus converted into potential energy in the torsion shaft, which is then used to accelerate the rotor rapidly in

Fig. 1 (below)—Small low-inertia electric motor for quick reversals

Fig. 2 (right)—Schematic diagram of two positive unidirectional clutches





a clockwise direction, automatically disengaging the clutch. To again reverse the direction of rotation, the housing is moved in a similar manner to the left, engaging the other clutch.

A description of the original high-speed reversal of an electric motor will be found in the Technical News Bulletin, National Bureau of Standards, May 1950, page 63, from which the illustrations were obtained.

Tool Steels for Varied Applications

(*Concluded from page* 89)

for cutting tools, the field is almost entirely taken up with high-speed steel as far as wrought products are concerned. There are many variations of high-speed steel starting with the familiar 0.70 per cent carbon, 18.00 per cent tungsten, 4.00 per cent chromium, and 1.00 per cent vanadium. Relatively high cobalt contents are used in some of these grades to increase their cutting efficiency on heavy cuts, and new high-speed steels have appeared within the last five to six years containing relatively large amounts of carbon and vanadium which are reported to improve cutting life under severe lathe turning conditions. This latter development is brought about because of the encroachment of carbide tools for cutting applications. Between the normal high-speed steel which is obtainable in wrought products and the carbide tools which are obtainable only in cast or powdered metallurgical forms, there is a vast field for high-speed steels showing a cutting efficiency between the standard grades of high-speed steels and the cast carbide grades. This field is still in a state of flux and development.

Extrusion Steels — The extrusion industry has a number of highly specialized hot work steels for extrusion dies, dummy blocks and containers. For our purpose of discussion, the steels shown in Fig. 2 as hot work steels could be representative of most applications, except that a 0.50 per cent carbon, 18.00 per cent tungsten, 4.00 per cent chromium, 1.00 per cent vanadium high speed steel is sometimes used in extrusion dies. Another steel which is finding some favor as a container steel contains 0.35 per cent carbon, 4.00 per cent molybdenum and 3.50 per cent chromium.

The cold heading industry requires straight carbon steels of closely controlled hardenability for upsetting and heading dies. The carbon is either 0.90 per cent or 1.00 per cent, with or without 0.25 per cent vanadium. Otherwise their needs are taken care of by Fig. 2. The same remarks apply to the pneumatic tool industry.

Plastic Mold Steels—Plastic mold steels are generally considered as tool or die steels at the present time. This is a relatively new industry and here considerable development work has been done in finding suitable steels for cold hubbing applications. After the die impression has been hubbed, the steel is generally carburized and then heat treated to develop a hard case. The making of a plastic mold die is an expensive process, whether machined or hubbed, and it is necessary to use steel of the highest quality to obtain almost perfect cavities and consequently defect-free plastic parts. The most common hubbing grade is a pure form of iron which must be made to tool steel standards because of the necessity for cleanness, soundness of the bars and freedom from porosity and segregation.

The next grade of plastic die and mold steel is an oil hardening steel containing low carbon with about 2.50 per cent chromium. This die steel will show less size change after carburizing and hardening than the hubbing iron because of its oil quenching properties. Finally, for applications which require the dies to work at about 500°F under fairly abrasive conditions, we have developed a hubbing steel which contains a low carbon, about 5.00 per cent chromium, and about 1.00 per cent molybdenum. This steel can be annealed soft for hubbing purposes and is obtained to tool steel standards. It can be carburized and then air hardened or oil quenched depending upon the application. It will show the least size change compared to either the oil or water hardening steel previously mentioned. These three die steels can be matched together to obtain a matched set of plastic mold die steels having the properties shown in Fig. 3.

Die Cast Steel—The die casting industry is well standardized on the 0.35 per cent carbon, 5.00 per cent chromium, 1.50 per cent molybdenum hot work steel shown in Fig. 2 for molds in die casting of aluminum. The 0.35 per cent carbon, 8.00 per cent tungsten, 3.50 per cent chrome hot work steel is used for die casting brass, but this is far from a satisfactory mold steel for this application. For other parts of the die casting machines and tools the steels shown in Fig. 2 suffice.

Stockpiled Flue Dust Returned

RESERVE supply of flue dust containing about 40 per cent iron ore and stockpiled near Wisconsin Steel Co.'s Chicago mill is used to keep the flue dust recovery program going in times of abnormal operating conditions. Recovery facilities are set up to take care of dust collected from the company's three furnaces but when one of them is down for rebuilding or repairs the company hires Industrial Cinder Co. to haul flue dust from the stockpile back to the plant. Handling equipment used by the contractor includes an International TD-14A crawler with a 2-yard bucket loader and four International trucks

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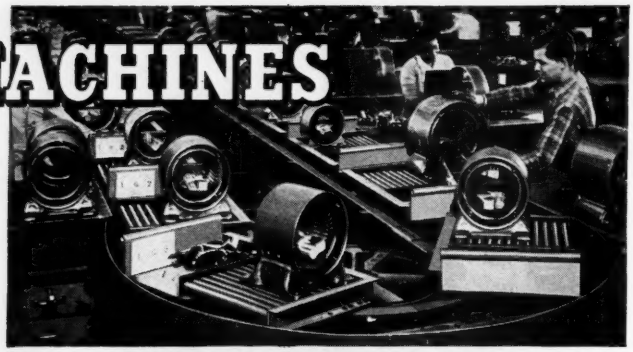

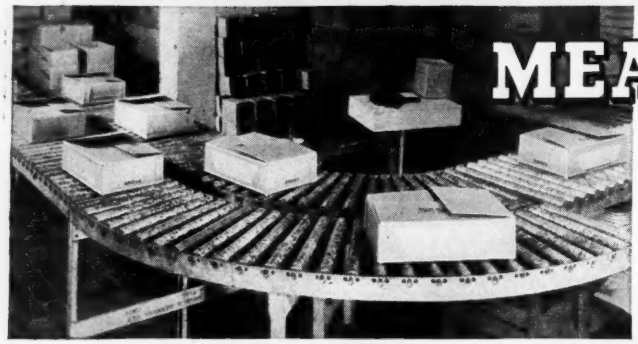

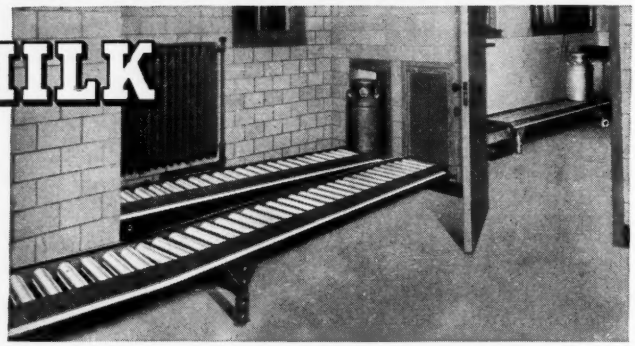

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VERTICAL LIFTS • PNEUMATIC TUBE SYSTEMS

Efficient Handling Pares Costs

Manufacturers of valves, pipe fittings and similar products will find valuable information on the savings that efficient materials handling methods make possible, described in a new certified job study prepared by Towmotor Corp. The study shows how the Columbia Malleable Castings Corp. Division, Grinnell Co. Inc., Columbia, Pa., cut overall handling costs by 60 per cent. On-the-job photos reveal how modern handling methods speeded up production and cut handling costs in each department of the Columbia plant. In the annealing department, for example, a 20 per cent saving in floor space was made, and a 50 per cent savings in man-hours, plus a 25 per cent speedup in handling, were effected in pouring castings into annealing pots.

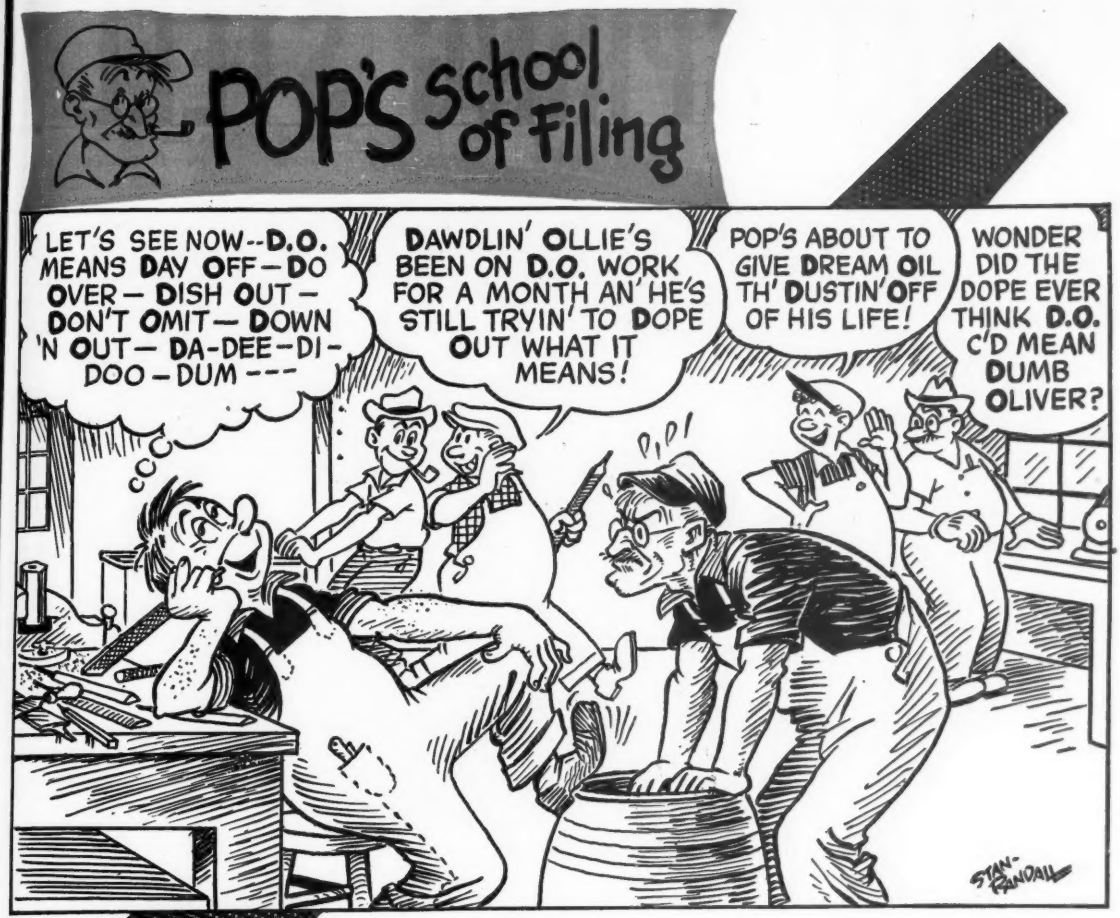
In the shipping department, a 300 per cent increase in fittings handled per man was made possible. A 200 per cent better use of storage floor space was made in the blank storage department. Savings made in the shearing and straightening department, union machining department, and hanger assembly department also are described in the job study.

Copies of certified job study No. 108, illustrated with action photos, are available on request to Towmotor Corp., 1226 E. 152nd St., Cleveland 10.

Copper-Bearing Stainless Data

In recent years a considerable number of copper-bearing stainless steel alloys have been developed and are now being commercially produced. Many of these special stainless steels are now extensively used in many applications which require alloys of high corrosion resistance or alloys exhibiting age-hardening properties. A bulletin prepared by Welding Research Council discusses in detail the physical, metallurgical, and welding properties of many experimental and commercial copper-bearing stainless steels containing up to 30 per cent chromium and between 0 and 35 per cent nickel. The copper additions in most of the discussed alloys usually varied between 1 and 5 per cent.

Among the topics covered are the phase relations, hot-working properties, corrosion resistance, age-hardening characteristics, effects of alloying elements such as Mn, Si, Mo, Cb, Ti, W, Be, V, stress-corrosion cracking, heat treatments, mechanical properties and weldability. In addition, detailed tables are given in which the various American and foreign patented and commercial alloys are listed. The report represents a


POP'S school of Filing
LET'S SEE NOW--D.O. MEANS DAY OFF—DO OVER— DISH OUT— DON'T OMIT— DOWN 'N OUT— DA-DEE-DI-DOO-DUM ---
DAWDLIN' OLLIE'S BEEN ON D.O. WORK FOR A MONTH AN' HE'S STILL TRYIN' TO DOPE OUT WHAT IT MEANS!
POP'S ABOUT TO GIVE DREAM OIL TH' DUSTIN' OFF OF HIS LIFE!
WONDER DID THE DOPE EVER THINK D.O. C'D MEAN DUMB OLIVER?
STAN RANDALL

Of course, only a cluck of Oliver's cranial capacity would fail to understand that D.O. means Defense Order . . . and that Uncle Sam wants no antiquated methods or low-grade tools slowing up *his* vital production jobs. Nor do industrial managements themselves.

Take filing operations. They represent production and assembly processes where poor results and untold man-hour losses can be incurred through the use of quick-dulling files of low-quality steel, haphazard cut and unscientific hardening.

Nicholson testing laboratories have proved this over and over — in unbiased comparisons that make the difference in file costs a mere "drop in the bucket" compared to the cost of labor wasted with poor files.

Nicholson and Black Diamond files definitely stay sharp longer—thereby removing stock faster and longer. That's not surprising, of course, since Nicholson has been making files for more than 80 years. Nevertheless, our engineers continue to discover new things about their manufacture year after year.

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Sold through industrial distributors under the Nicholson policy of TWELVE PERFECT FILES IN EVERY DOZEN.

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FREE — *48-page book, "FILE FILOSOPHY," on kinds, use and care of files. Write for as many copies as you need for purchasing and key production men.*

NICHOLSON FILE CO. • 71 ACORN STREET • PROVIDENCE 1, RHODE ISLAND
(In Canada, Port Hope, Ont.)

NICHOLSON FILES FOR EVERY PURPOSE

FLAT SPRING STEEL

No more waiting! Roebling's expanded facilities can meet your needs right now!

PROMPT! FAST! . . . that's the sort of deliveries you can count on now for Roebling high carbon flat mechanical spring steel. For many years Roebling has had one of the largest specialty mills in the country and today's expanded facilities have boosted production to new highs.

Roebling flat spring steel is made as you want it . . . annealed, hard rolled untempered; scaleless tempered; tempered and polished, blue or strawed.

And from open hearth to finished product, Roebling positive control assures uniform quality . . . saves preparation time for users . . . brings faster, smoother production.

Roebling is ready to furnish flat spring steel with the exact mechanical properties required for any special type of application. Write or wire now for full information. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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Atlanta, 934 Avon Ave ★ ***Boston,*** 51 Sleeper St ★ ***Chicago,*** 5525 W. Roosevelt Rd ★ ***Cincinnati,*** 3253 Fredonia Ave ★ ***Cleveland,*** 701 St. Clair Ave, N.E. ★ ***Denver,*** 4801 Jackson St ★ ***Detroit,*** 915 Fisher Building ★ ***Houston,*** 6216 Navigation Blvd ★ ***Los Angeles,*** 216 S. Alameda St ★ ***New York,*** 19 Rector St ★ ***Odessa, Texas,*** 1920 E. 2nd St ★ ***Philadelphia,*** 230 Vine St ★ ***San Francisco,*** 1740 17th St ★ ***Seattle,*** 900 1st Ave, S. ★ ***Tulsa,*** 321 N. Cheyenne St ★ Export Sales Office, ***Trenton, N. J.***

compendium of 166 references representing published articles as well as many unpublished contributions received from various research investigators in the United States and abroad.

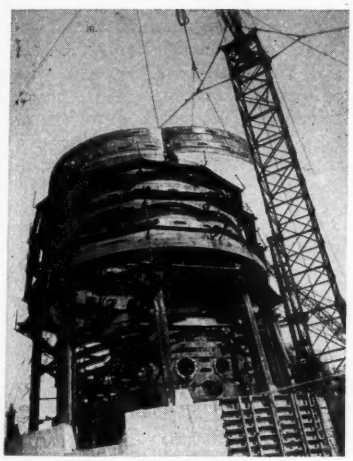
Copies at $1 each may be obtained from Welding Research Council, 29 W. 39th St., New York 18.

Up-to-Date Gage Standard

Revised edition of "American Standard for Screw Thread Gages and Gaging" has been approved by American Standards Association, New York. This edition brings methods up to date for checking threaded products to see if they comply with the requirements for unified and American screw threads for screws, bolts, nuts and other threaded parts. The unified threads were approved in 1949 by Great Britain, Canada, and the U. S.

Included in the standard are tables for W and X tolerances on lead, half angle of thread; major, minor, and pitch diameter; and wear allowances on pitch diameter, for go, hi and lo thread gages. It also shows Z tolerances for plain plug gages for checking minor diameter of internal and major diameter of external threads. The terms "hi gage" and

Iron Making Capacity Rises



STEELMAKING capacity expansion at Republic Steel Corp.'s Cleveland works includes this 1470-ton per day blast furnace scheduled for completion in January. After placement each 7-foot section in the 140-foot high furnace is welded. Holes below are for tuyere pipes through which air heated to 1250° F will be blown at speeds up to 350 miles per hour through the furnace. Hearth diameter of the furnace is 28 feet

GETTING HYDROGEN FROM AMMONIA?

Impurities cause costly shutdowns for catalyst cleaning

That's why it pays to use . . .

DU PONT "NATIONAL"* ANHYDROUS AMMONIA

IN CYLINDERS

99.99% AMMONIA

Du Pont "National" Anhydrous Ammonia is the purest ammonia sold commercially. The contents of every cylinder are tested after filling to be sure the minimum standard of 99.99% ammonia is maintained. It's always uniform, always dependable, always dry—with a moisture content of less than 50 parts per million.

Oil causes carbon deposits on your catalyst. But in dissociating "National" Ammonia, frequent shutdowns to remove these deposits are eliminated. And your yield is good—one 150-lb. cylinder dissociated gives you the equivalent of 25½ cylinders of hydrogen. To serve you quickly, there are distributors and stock points conveniently located across the country. E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Dept., Wilmington 98, Delaware.

DISTRICT OFFICES:

818 Olive St., St. Louis 1, Mo.; 350 Fifth Avenue, New York 1, N. Y.; 7 S. Dearborn St., Chicago 3, Ill.; 845 E. 60th St., Los Angeles 1, Calif.

*REG. U. S. PAT. OFF.

Do you know these other Du Pont chemicals for metal treating?

HYDROXYACETIC ACID 70%

For bright dipping of copper, electro-polishing of stainless steel and electroless plating of nickel.

METHANOL

Source of hydrogen and carbon monoxide for an efficient reducing atmosphere in many metallurgical operations, and for the cleaning of metal parts during fabrication.

For product information on these and other chemicals, please write on your letterhead.

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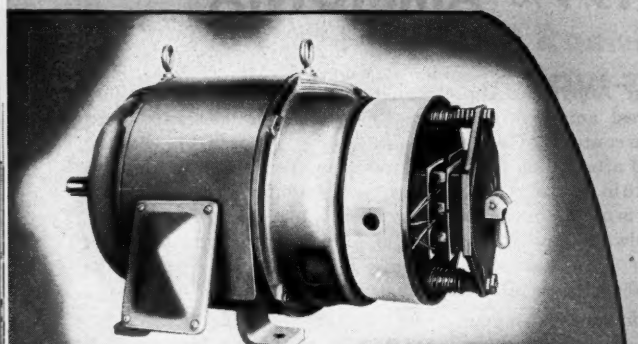
NEW!

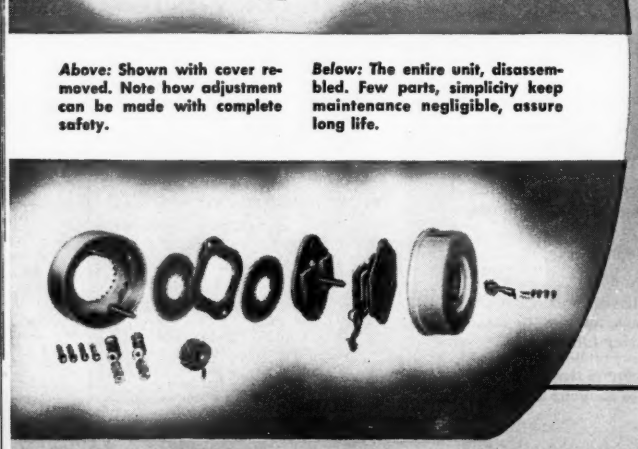
DINGS DIRECT ACTING DISC-TYPE MAGNETIC BRAKES—AC OR DC

with these new design features:

- **SIMPLE • COMPACT • NO SOLENOIDS**
- **NO MECHANICAL LINKAGES • HIGHEST THERMAL RATINGS**
- **INSTANT, SMOOTH OPERATION • EXTRA SAFETY FEATURES**



Above: **Shown with cover removed. Note how adjustment can be made with complete safety.**



Below: **The entire unit, disassembled. Few parts, simplicity keep maintenance negligible, assure long life.**

● THE new Dings Disc Type Magnetic Brake is designed to stop any motor smoothly and instantly, to hold the load with absolute dependability and to release with no drag. Typical applications: machine tools, hoists, cranes, elevators, screwdowns, etc., and a variety of other applications where automatic, controlled braking is required. Dings Brakes are spring engaged and magnetically released and are designed to mount on NEMA TYPE C motor flanges.

FEATURES AND ADVANTAGES

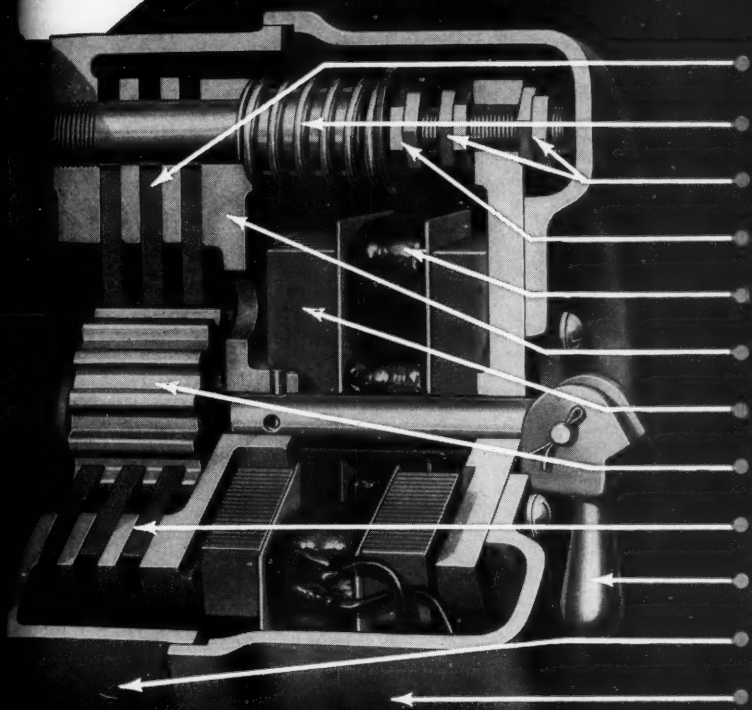
SIMPLE, COMPACT. There are *no solenoids, no mechanical linkages.* Friction disc, pressure plate, springs and magnet constitute the heart of the unit. (See photo at lower left.)

HIGHEST THERMAL RATINGS. *New* highs in thermal ratings have been obtained in the Dings Brake. Catalog B-4000-A contains exact ratings.

INSTANT OPERATION. Movement of braking assembly is measured in thousandths of an inch. Braking or releasing is therefore virtually instantaneous.

EASY INSTALLATION. Brake mounts in a few minutes. *Dismantling before installing is not necessary.*

EASY ADJUSTMENT. Torque and wear adjustment is



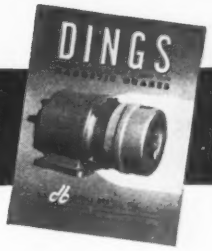
made by a twist of the wrench on a set of double lock nuts. Visual inspection of position of manual release lever is all that is needed to check for wear.

MANUAL RELEASE. A manual release lever, located outside the housing, is standard. Use of lever enables operator to disengage brake, allows shaft free rotation when desired. This mechanism automatically resets itself, restores unit to usual operating condition when power is again applied.

SAFETY FEATURES: In adjusting, it is impossible for operator to increase torque beyond ability of magnet to release. In addition, the shell of the housing shrouds the rotating discs, enabling the operator to make inspection and adjustment with complete safety while unit is in operation.

It's new. It's different. It's the *combination* of advantages that make this new brake worth looking into.

SEND FOR BRAKE BULLETIN



gives complete torque ratings, thermal ratings, dimensions . . . describes principle of operation, construction, installation. Everyone concerned with brakes should have a copy.

DINGS BRAKES, INC.

4740 WEST ELECTRIC AVENUE • MILWAUKEE 46, WISCONSIN

A Subsidiary of: DINGS MAGNETIC SEPARATOR COMPANY

EXCLUSIVE BUILDERS OF MAGNETIC SEPARATORS, LIFTING MAGNETS AND MAGNETIC SPECIALTIES

"lo gage" are now applied to the gages previously called "no go gages".

Generator Hits 60,000 kw

One of the largest single-shaft turbo-generators ever built for industrial power production is in operation at U. S. Steel Co.'s South Works, S. Chicago, Ill. Housed in a new ten-story addition to No. 5 power station, the generator is a principal installation in the plant's multi-million dollar improvement program.

Steam is provided by boiler with capacity of 650,000 pounds an hour. Operating at 900 pounds, 900° F at the superheater outlet and equipped with water-cooled walls, this boiler is the largest ever installed to utilize blast furnace gas. Formerly the plant's excess was bled to the atmosphere. The 60-cycle, 3-phase turbo-generator has a power factor of 0.85 and generates 60,000 kw at 13,800 v. It has a direct-connected exciter and a hydrogen cooling system. When operating at capacity, the generator produces enough electric power to service a community of 150,000 people.

Power generated at 13,800 v is transmitted to the company's Gary district plants. An underground duct system transmits current to a 77,000-kva transformer in the outdoor substation where voltage is stepped up to 69,000 v for transmission over two existing overhead circuits. These lines are controlled by selective pole-reclosing circuit breakers. A carrier current system is provided for relaying, telephone communication, and telemetering.

Facts for Caustic Soda Users

Pennsylvania Salt Mfg. Co., Philadelphia, has issued a caustic soda bulletin. Divided into four sections under tabled headings, the booklet provides handy reference for particular problems on purchasing, handling and storage, equipment design and technical data. The comparison of various forms of caustic soda and the evaluation of shipping and ordering points are helpful in selecting the form of this chemical most economical for use at various plants.

The section on equipment design deals with the problems of engineering, construction and maintenance personnel. Charts and tables showing freezing point, specific gravity at various temperatures, NaOH content and density and other properties of caustic soda will give technicians and chemists readily-available answers to their particular questions.

A separate leaflet covering instructions for safe handling of caustic soda tank cars is inserted in the flyleaf of the main bulletin. Detailed instructions for steaming and unloading 50 and 72 per cent caustic soda, general information and personal precautions are included. Requests for the bulletin and leaflet should be written on company letterhead and addressed to Pennsalt Chemicals, 1000 Widener Bldg., Philadelphia 7, Pa.

Steel Stabilized Quickly

Complete dimensional stabilization of steel, ordinarily requiring years of seasoning, is now being effected in a matter of hours chilling to —120°F. in subzero industrial chilling machines, manufactured by Sub-Zero Products Division, Deepfreeze Distributing Corp., Cincinnati.

In ordinary heating and quenching of steel not all the austenite is transformed to martensite. This unchanged portion causes dimensional growth and warp over a period of time. However, it has been found that repeated cycles of heating to room temperature and chilling to minus 120° F bring about 100 per cent transformation of austenite to martensite. As a result of this change complete stabilization is obtained. At the same time

Science...
at the Crossroads
of the East

NEW JERSEY offers a center of scientific research unmatched by any area of the country.

In fact, there is an area in New Jersey which abounds with such outstanding research facilities that several industrialists have suggested that New Jersey is "The Scientific State."

Almost everything used in day by day living has been improved by New Jersey research. A few of the products developed at the Crossroads of the East include the electric light, the radio, television, the typewriter, the telephone, the telegraph, motion pictures, drugs, patent leather, high-octane gasoline, and improved lubricating oils.

Write for your copy of the new digest about New Jersey, "An Industrialist's View of the Crossroads of the East." Box D, 76 Park Place, Newark, N. J.

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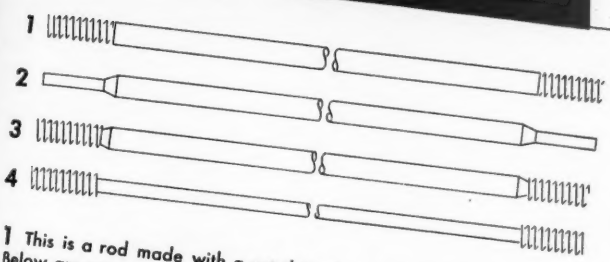
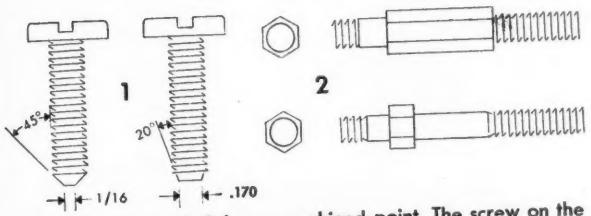
NEW JERSEY CROSSROADS of the EAST

Save Money



1 This is a rod made with a cut thread on each end of ¼" wire. Below are examples of how same rod can be made for less money.
2 Shows rod of ¼" wire with ends extruded ready for threads to be rolled.
3 Same rod as shown in Sketch #2 after threads have been rolled. Diameter of the threaded sections and unthreaded section are the same as shown in Sketch #1. The rolled threads are stronger than the cut threads.
4 Biggest saving would be made by using, in this case, a rod of .214/.216 diameter with threads rolled on each end. This would result in a savings of $30 per thousand over rod shown on Sketch #1. The tensile strength of the rod is determined by the thread, therefor the tensile strength of the rod is comparable to the other.

Save Time



1 The screw at left has a machined point. The screw on the right has a cold headed point which would save up to $4.00 per thousand. Note the slight difference in the taper of the point and diameter which in many applications would make little difference.
2 The top sketch shows a stud machined out of hex bar with resulting waste of steel and machine time. The bottom sketch shows a design which was upset and threaded, with considerable savings in steel and time resulting in a large saving to the customer.

Save Steel

1 Bolt has a machined point and cut threads. These operations are comparatively expensive.
2 The same bolt made with extruded end and rolled point. Diameter is reduced to permit thread to be rolled to same diameter as shank.
3 Completed bolt with rolled thread. Can be produced faster and at lower cost than bolt shown in Sketch #1.

HOW TO DESIGN SMALL PARTS

to save time — material

and as much as $30.00 per M

How a slight change in design saves time, material and reduces cost of small parts and fasteners is demonstrated by these examples. You may find that many such items you are using now in quantity could be redesigned to save you from $4.00 to $30.00 per thousand without impairing the efficiency of the part in any way. In fact, many parts are improved in strength by cold-heading. Also, the process is fast, lends itself to mass production and conserves critical material.

As specialists in cold heading, Townsend engineers help manufacturers in all industry reduce the cost and improve the efficiency of their parts and fasteners. They may be made of carbon steel, alloy steels, bronze, copper, monel and aluminum. These are supplied in a variety of platings and finishes. If you want to learn more about how you can improve your product and at the same time reduce costs send us a sample or sketch of the item and we will give you a suggestion.

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We specialize in the production of sleeve bearings and parts with bearing properties.
Within our six-plant manufacturing organization, our products range from simple spacer tubes to big, precision bearings weighing hundreds of pounds each. We work with babbitt, copper-lead, bronze, steel, brass, aluminum or silver—in standard or special alloys to meet exact specifications.
All production rigidly quality-controlled. Research and engineering facilities available without obligation. FEDERAL-MOGUL CORPORATION, 11051 Shoemaker, DETROIT 13, MICHIGAN
Since 1899
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greater hardness, strength and ductility is obtained according to the manufacturer's reports.

This application of subzero chilling is found effective on any steel part where dimensional stability is important. One valuable application is in the seasoning, setting and counter-annealing of gages. After subzero cycling, the gages hold their finished size under all normal temperature changes and handling. One instance cited by the manufacturer is the lapping plates and surface plates used in gage manufacturing. After subzeroing, these plates retain their accuracy for two to three days, whereas formerly it was necessary to resurface them every two to three hours.

Production Will Quadruple

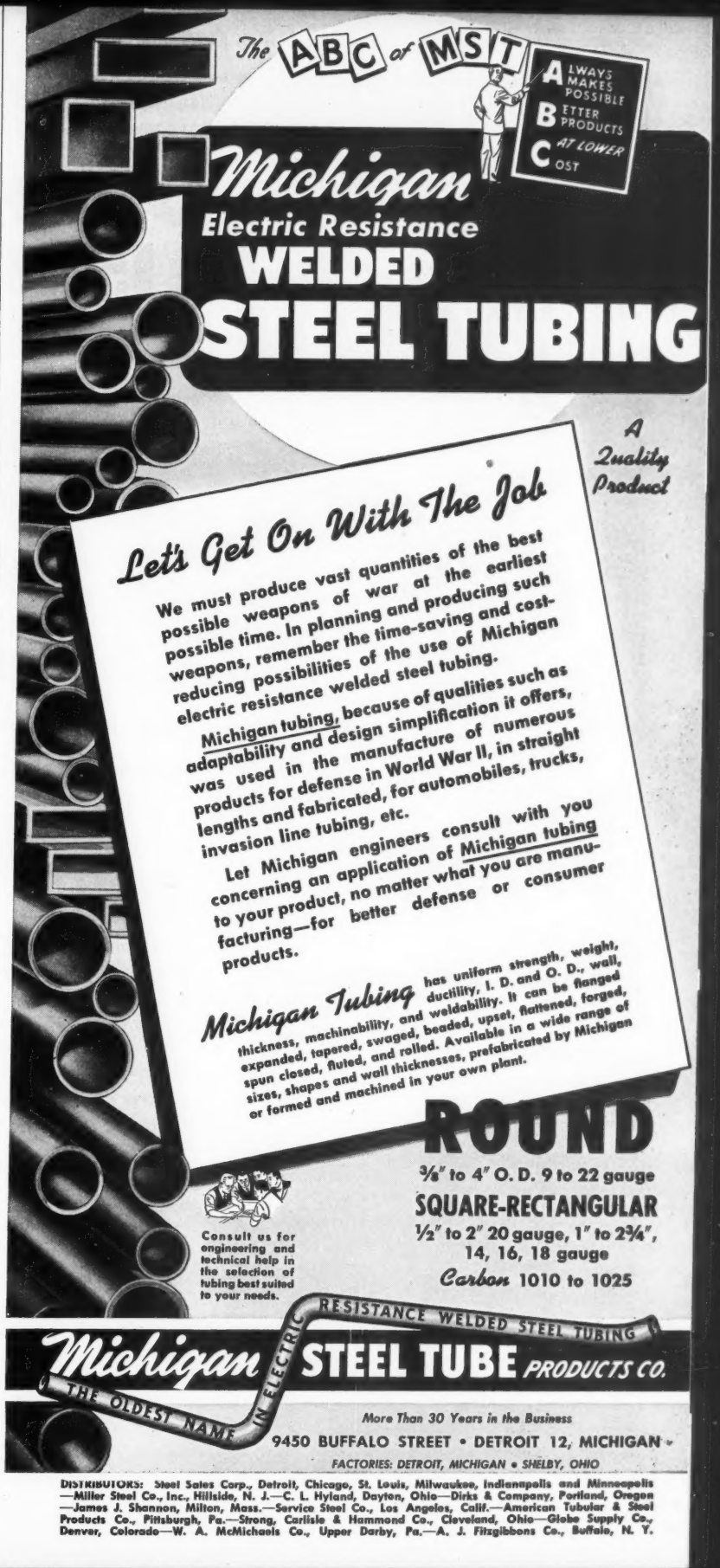
A specialty metal, Electroshield, introduced in 1950 by American Cladmetals Co. to shield electronic communication equipment from outside interferences, will be produced in 1952 at a rate four times present production, says Joseph Kinney Jr., president. It uses less copper than shields previously employed and weight for weight is much stronger, having a core of steel clad on each side with copper.

Steel and copper used in the specialty metal are bonded together permanently by means of the Kinney process, which is owned by the company. Metal is made in light and heavy sheets up to about 35 square heavy sheets up to about 35 sq ft in area. It is readily workable and easy to weld or solder.

Steel Cleaning Data Available

Oakite Products Inc., announces publication of a 28-page illustrated booklet, "Four Good Steps Toward Better Electroplating on Steel," giving specific recommendations for effecting improvements in the average cycle for cleaning steel before electroplating.

Booklet lists in detail the benefits to be gained by: 1. Precleaning more thoroughly—because the electrocleaning tank operates more economically and more effectively when the heavy oils and greases are removed by precleaning; 2. rinsing more thoroughly—because inadequate rinsing is the recognized cause of a large portion of plating difficulties; 3. using reverse current cleaning for all electrocleaning of steel—because it does a more thorough job of removing a variety of films that are unfavorable to the adhesion of electrodeposited metals; and 4. using an efficient electrocleaner that provides high conductivity, superior smut removal, long


The ABC of MST
A LWAYS MAKES POSSIBLE
B ETTER PRODUCTS
C AT LOWER OST
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Electric Resistance
WELDED
STEEL TUBING
A Quality Product
Let's Get On With The Job
We must produce vast quantities of the best possible weapons of war at the earliest possible time. In planning and producing such weapons, remember the time-saving and cost-reducing possibilities of the use of Michigan electric resistance welded steel tubing.
Michigan tubing, because of qualities such as adaptability and design simplification it offers, was used in the manufacture of numerous products for defense in World War II, in straight lengths and fabricated, for automobiles, trucks, invasion line tubing, etc.
Let Michigan engineers consult with you concerning an application of Michigan tubing to your product, no matter what you are manufacturing—for better defense or consumer products.
Michigan Tubing has uniform strength, weight, thickness, machinability, and weldability. It can be flanged expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.
ROUND
⅜" to 4" O. D. 9 to 22 gauge
SQUARE-RECTANGULAR
½" to 2" 20 gauge, 1" to 2¾", 14, 16, 18 gauge
Carbon 1010 to 1025
Consult us for engineering and technical help in the selection of tubing best suited to your needs.
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THE OLDEST NAME IN ELECTRIC
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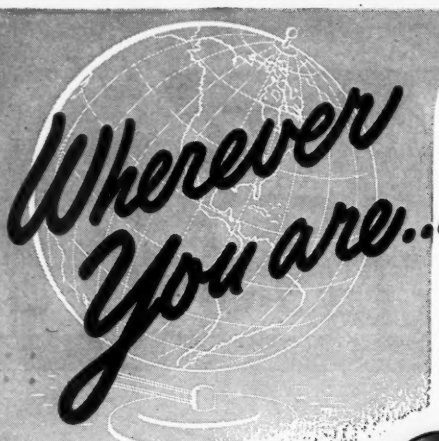
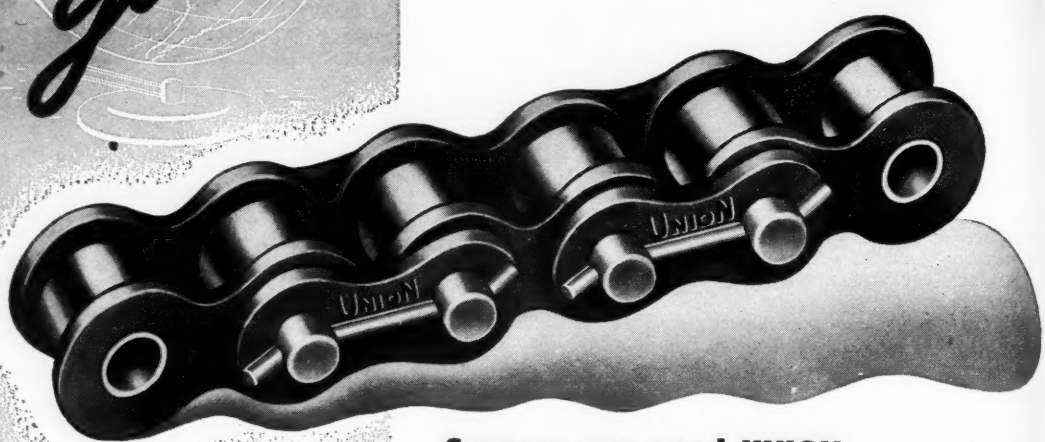


UNION CHAIN IS NEAR BY



Suppose you need UNION Machine Finished Steel Roller Chain...

... and are certain of the pitch, length and sprockets required. Just write or phone your nearest Union Chain Stock Carrying Distributor listed on the facing page. He will make every effort to ship your requirements promptly.

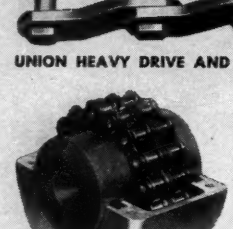
... or suppose you need engineering assistance in the selection of a drive or a recommendation for a conveyor application. Talk or write to Union Chain's nearest district office as listed at the top of the facing page. You will receive unprejudiced, competent help.

Unprejudiced because Union Chain makes all types of steel sprocket chains and is interested in providing each customer with the correct chain for satisfactory service at minimum cost.

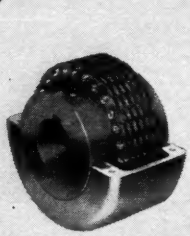
Competent because Union Chain representatives are qualified through experience to make sound chain recommendations whether the application calls for roller chain, silent chain or one of the various heavy drive or conveying chains. We suggest it might profit you to discuss your chain problems with us.

UNION SILENT CHAIN

UNION HEAVY DRIVE AND CONVEYING CHAINS



UNION
ROLLER CHAIN
FLEXIBLE COUPLINGS



UNION
SILENT CHAIN
FLEXIBLE COUPLINGS

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Huntington Park, California

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208 Walton Bldg.
Atlanta, Georgia

ILLINOIS
Union Chain & Mfg. Co.
W. Albrecht
A. C. Mohr
B. Nelson
Room 1232
53 W. Jackson Blvd.
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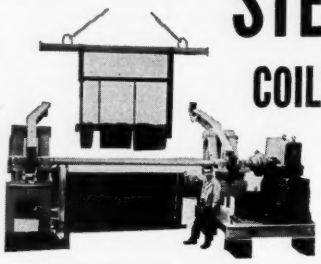

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solution life and other advantages.

Also of interest to platers are the answers presented in the booklet to such questions as: How can cleaning costs be reduced 33 per cent while plating quality is being improved? What are four easy ways to improve the average rinse tank? What rinsing fault invites trouble in the plating of high-carbon steel? How can an ordinary electrocleaning cycle be transformed into an exceptionally good cycle? Copies of this booklet may be secured from Oakite Products Inc., 134E Thames St., New York 6.

Atomic Patents Available

Descriptions of 25 patents owned by the U. S. Government and held by the Atomic Energy Commission have been transmitted to the U. S. Patent Office for registry and listing in the official register of patents. The commission will grant nonexclusive, royalty-free licenses on the listed patents, as part of its program to make nonsecret technological information available for use by industry. Commission-held patents and patent applications released for licensing now total 342.

Applicants for licenses should apply to the Chief, Patent Branch, Office of the General Counsel, U. S. Atomic Energy Commission, Washington 25, D. C., identifying the subject matter by patent number and title. Copies of these patents may be obtained from the U. S. Patent Office.

Slide Chart for Heat Treaters

To put authoritative heat treating data into the hands of tool and diemakers and heat treaters, Carpenter Steel Co., Reading, Pa., has prepared a compact heat treating slide chart. Measuring 5 x 11 inches, the chart is convenient to use yet gives complete answers to items such as heating speed, furnace atmosphere, drawing temperature and time for drawing.

It contains data on type analyses of the more popular types of die steels, forging heat, annealing treatment and hardening treatment. Also included are facts on quenching, effect of drawing temperature on hardness, and others.

Lacquer Specifications Given

Egyptian Lacquer Mfg. Co. in an effort to be of service to product manufacturers and commercial finishers has published a booklet listing practically all U. S. Government specification finishes issued to date of printing. Booklet lists the speci-

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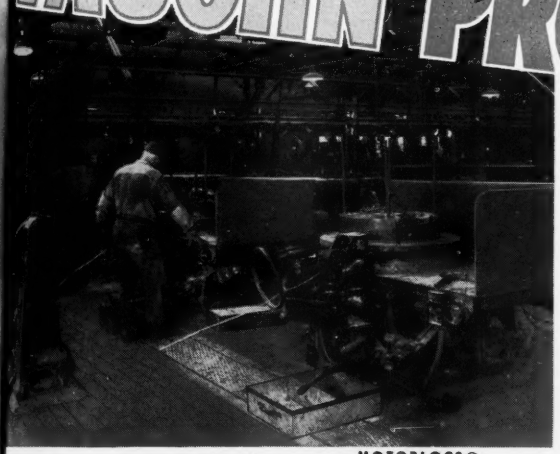

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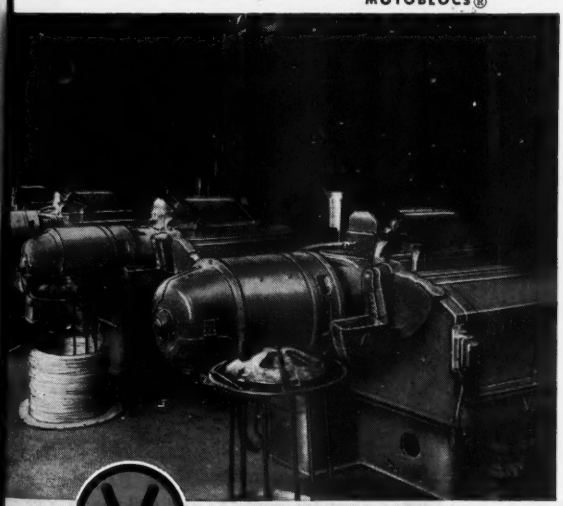

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fication code number, gives complete ingredient detail and shows drying periods required between applications.

As new specifications are released the company will make supplements available. When requesting a copy of this booklet please use your company letterhead and state title or connection. Address requests to Egyptian Lacquer Mfg. Co., Box 444, Newark 1, N. J.

Switch Facts for Designers

A 12-page folder describing in detail the Rotary Packet switches manufactured by Arrow-Hart & Hegeman Electric Co. is offered without charge to design engineers and others interested in this product. The folder shows in detail the many combinations available and provides engineering data, ratings, dimensions and mounting types.

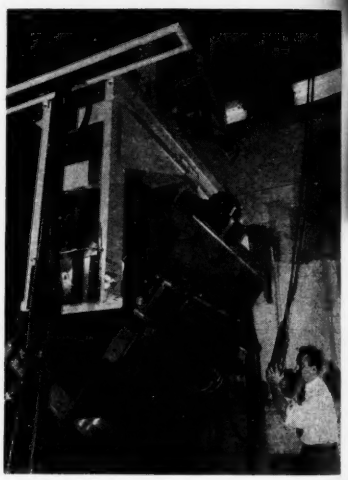
The switches are made for controlling electrical circuits operating at current ratings of 10, 25, 30, 60, 100, 200 and 500 amperes and voltage ratings from 115 to 600 v ac and up to 250 v dc. For special applications that may not be covered in this folder, Arrow-Hart & Hegeman has provided a form which outlines the type of information required to enable the manufacturer's engineers to recommend and fabricate switches of unusual design. Copies of the folder are available on request from the Appliance Control Division, The Arrow-Hart & Hegeman Electric Co., Hartford 6, Conn.

Quality Castings Described

A new 48-page book entitled "Hamilton Quality Castings" was recently published by Hamilton Foundry & Machine Co., Hamilton, O. The company states its aims in publishing the book are to: Provide castings users with a book that will be helpful to them by contributing to their understanding of iron castings and the importance of quality in their selection; and present to industry a new and unusual addition to casting literature.

Dozens of typical castings and a few unusual castings made up specially for customers are illustrated.

Betatron Checks Equipment



PRODUCTION LINE inspection of heavy ordnance equipment is being performed by an Allis-Chalmers motorized industrial betatron at Continental Foundry & Machine Co.'s East Chicago, Ind., plant. Located in the same area originally occupied by a 1 million volt x-ray machine which was too slow for production inspection of large pieces, the 20-million volt betatron has greater flexibility and five times the penetrating power of the old machine. It is capable of detecting flaws as small as 0.02-inch in castings, forgings and weldments from 1 to 24 inches thick. Areas from 6 inches long to sections over 20 feet in length can be examined

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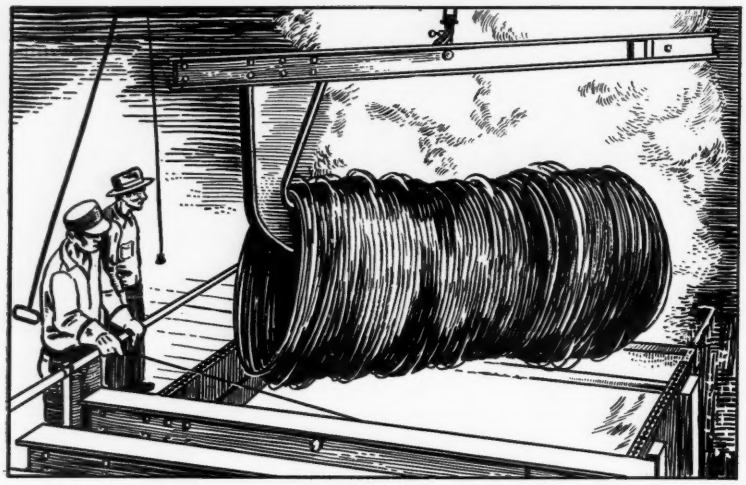

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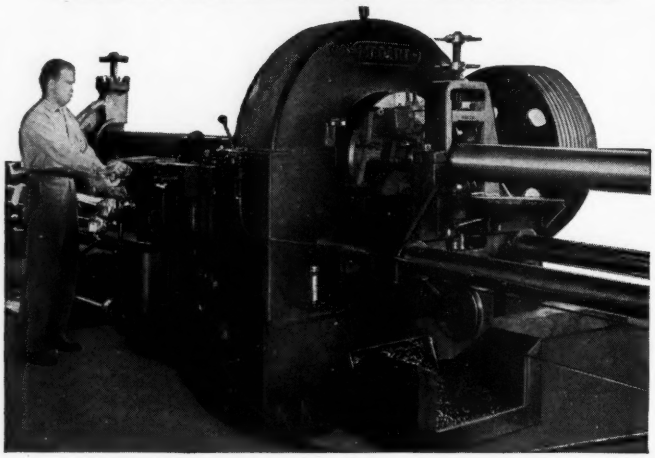

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CALENDAR OF MEETINGS

† *Denotes first listing in this column.*

November 11-14, American Supply & Machinery Manufacturers Association: Mid-Year meeting, The Homestead, Hot Springs, Va. Association address: 731-732 DuPont Circle Bldg., Washington. General manager: E. Kennedy Hanson.

November 12-15, National Automatic Merchandising Association: Convention & exhibit, Public Auditorium, Cleveland. Association address: 7 S. Dearborn St., Chicago 3. Executive director: Clinton S. Darling.

November 12-16, National Electric Manufacturers Association: Annual fall meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Association address: 155 E. 44th St., New York 17. Managing director: W. J. Donald.

November 14-15, Industrial Hygiene Foundation: Annual meeting, Mellon Institute, Pittsburgh. Foundation address: 4400 Fifth Ave., Pittsburgh 13. Managing director: John F. MacMahon.

November 14-16, National Metal Trades Association: Annual convention, Palmer House, Chicago. Association address: 122 S. Michigan Ave., Chicago 3. Secretary: Charles L. Blatchford.

November 15-16, The Magnesium Association: Annual meeting, Biltmore Hotel, New York. Association address: 122 E. 42nd St., New York 17. Assistant secretary: Martha I. Hanson.

November 15-16, American Zinc Institute: Fall meeting, The Galvanizers Committee, St. Francis Hotel, Canton, O. Institute address: 60 E. 42nd St., New York 17. Secretary: E. V. Gent.

†**November 15-16, American Society for Quality Control:** Midwest quality control conference and exhibit, Hotel Sherman, Chicago. Conference address: 1 N. LaSalle St., Chicago 2. Conference secretary: W. G. Collins.

November 15-16, American Council of Commercial Laboratories: Annual meeting, Baker Hotel, Dallas. Council address: 4302 East-West Highway, Washington 14. Executive secretary: H. M. Dudley.

November 16, Association of American Railroads: Fall conference, Blackstone Hotel, Chicago. Association address: Transportation Bldg., Washington 6. Secretary-Treasurer: G. M. Campbell.

November 26-December 1, Chemical Industries Exposition: Grand Central Palace, New York. Manager: Charles F. Roth, International Exposition Co., New York; chairman: E. R. Weidlein, Mellon Institute.

November 28-30, Scientific Apparatus Makers Association: Mid-year meeting, industrial, optical, aeronautical and military instrument sections, Hotel New Yorker, New York. Association address: 20 N. Wacker Drive, Chicago 6. Secretary: Kenneth Anderson.

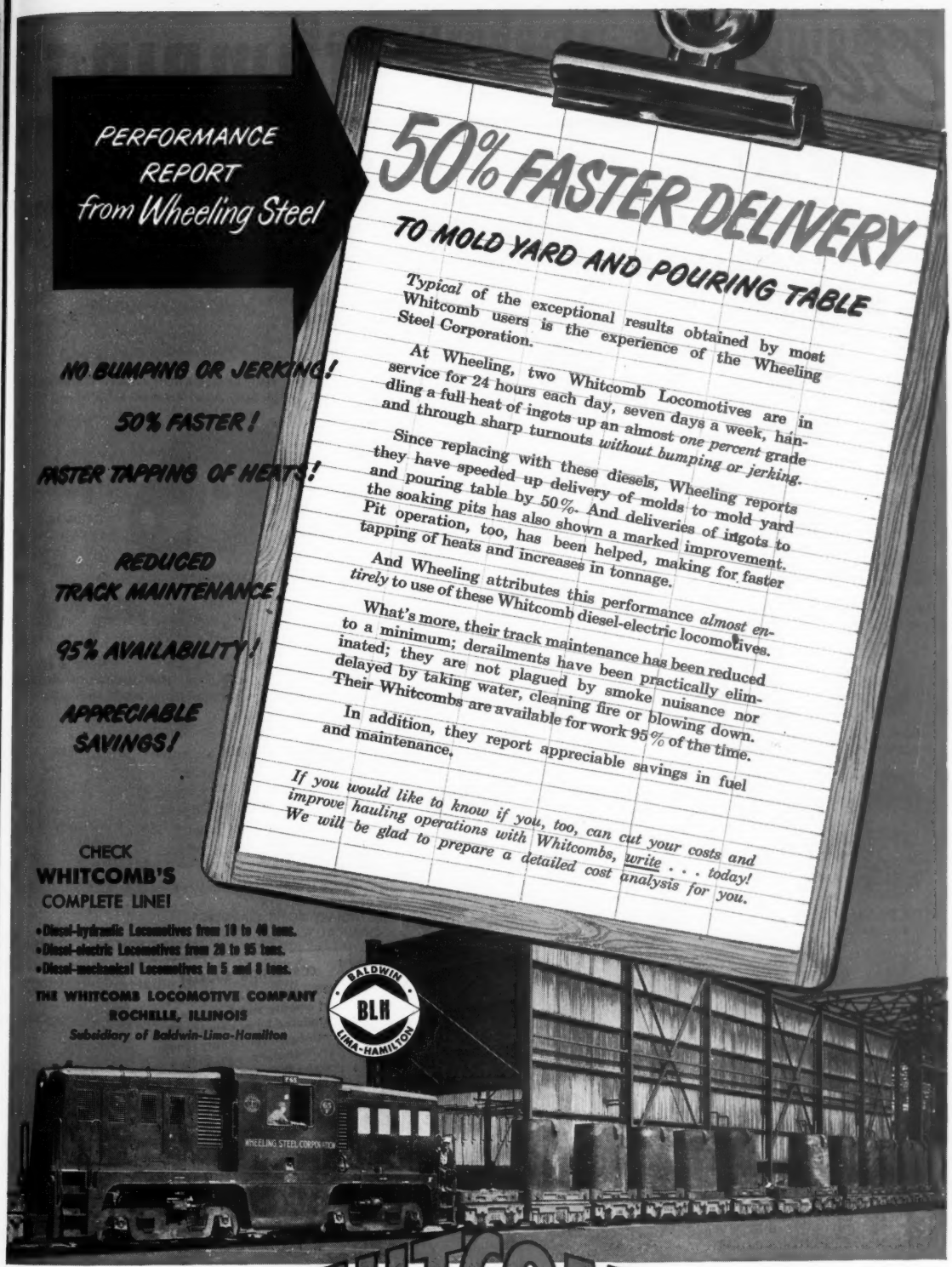
†**November 28-30, Society for Experimental Stress Analysis:** Annual fall meeting, Bellevue-Stratford Hotel, Philadelphia. Society address: Box 168, Central Sq. Station, Cambridge 39, Mass. Secretary: Professor W. M. Murray.

November 29, American Iron and Steel Institute: Regional technical meeting, Hotel Cleveland, Cleveland. Institute address: 350 Fifth Ave., New York. President: Walter S. Tower.

November 29-30, Annual Pittsburgh Diffraction Conference: Mellon Institute, Pittsburgh. Preliminary program information: C. W. Cline, Aluminum Research Laboratories, New Kensington, Pa.

December 5, Steel Kitchen Cabinet Manufacturers Association: First annual meeting, Hotel Cleveland, Cleveland. Association address: Engineers Bldg., Cleveland 14. Secretary: Arthur J. Tuscany.

December 6-8, American Institute of Mining & Metallurgical Engineers: Electric furnace steel conference, William Penn Hotel, Pittsburgh. Institute address: 29 W. 39th St., New York 18. Secretary: Edward H. Roble.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At Wheeling, two Whitcomb Locomotives are in service for 24 hours each day, seven days a week, handling a full heat of ingots up an almost one percent grade and through sharp turnouts without bumping or jerking.
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And Wheeling attributes this performance almost entirely to use of these Whitcomb diesel-electric locomotives.
What's more, their track maintenance has been reduced to a minimum; derailments have been practically eliminated; they are not plagued by smoke nuisance nor delayed by taking water, cleaning fire or blowing down. Their Whitcombs are available for work 95% of the time.
In addition, they report appreciable savings in fuel and maintenance.
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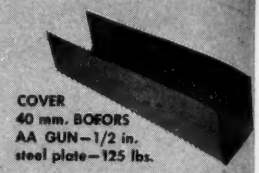
THE WHITCOMB LOCOMOTIVE COMPANY
ROCHELLE, ILLINOIS
Subsidiary of Baldwin-Lima-Hamilton
BALDWIN BLH LIMA-HAMILTON
WHEELING STEEL CORPORATION
For better efficiency!
WHITCOMB
DIESEL LOCOMOTIVES
For lower operating costs!

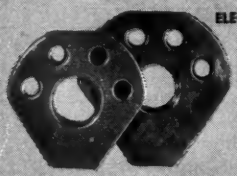
Creative METAL STAMPINGS

Save METAL - TIME - COST
for Prime Contractors of products for the Armed Services

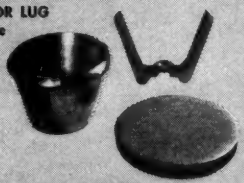
A few of the many military metal stampings produced by the LEAKE organization

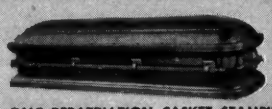


COVER
40 mm. BOFORS AA GUN—1/2 in. steel plate—125 lbs.



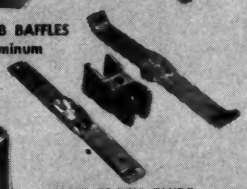
ELECTRICAL CONNECTOR LUG
Heavy Gauge Copper Tubing





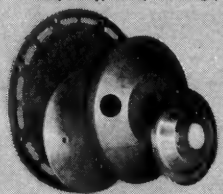
RADIO PROXIMITY FUSE HOUSINGS SIGNAL CORPS—Silver Brazed Assembly

QMC REPATRIATION CASKET STAMPINGS: Lid, Body, Base, Moldings, Rings, Plates, Clips

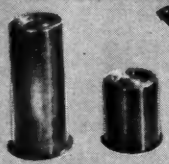


USAF NAPALM BOMB BAFFLES .102" x 52S-0 Aluminum

COLD EXTRUDED CUPS
Steel Cartridge Cases



ORDNANCE CAPACITOR CAN—Deep Drawn Brass



NAVAL OIL FILTER SHELLS
Deep Drawn Brass and Steel

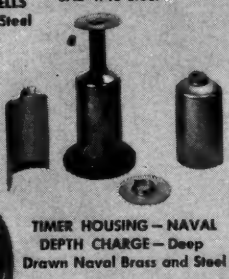
HALF TRACK GUIDE & CROSS PLATES SAE-4140 Steel

ORDNANCE BOOSTER CASINGS

AIRCRAFT ALUMINUM WHEEL FAIRINGS

HEAD & BASES FRAGMENTATION BOMBS
21,000 each daily

MAIN BEARING AIRCRAFT ENGINE

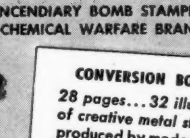


ORDNANCE BOMB FUSE ADAPTER—5/16-in. Drawn Steel Plate

40 mm. BOFORS AA GUN: Stamped Brass Components

TIMER HOUSING—NAVAL DEPTH CHARGE—Deep Drawn Naval Brass and Steel

"WATER BUFFALO" STAMPINGS
Heavy Gauge SAE-4130 Steel

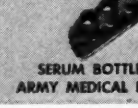


INCENDIARY BOMB STAMPINGS CHEMICAL WARFARE BRANCH

TANK SEAT BACK STAMPING

IDLER WHEELS FOR TANKS
1/4-in. steel—15-in. dia.

AERIAL DEPTH CHARGE STAMPINGS



BASE PLUG FOR 20 mm. SHELL—.550" dia. x .114" thick steel

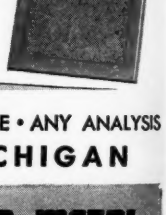
SERUM BOTTLE HOLDER
ARMY MEDICAL DEPARTMENT

AIRCRAFT SUPERCHARGER BEARING SAE-4145 Steel

HEAVY GAUGE TANK STAMPINGS

CONVERSION BOOKLET

28 pages... 32 illustrations of creative metal stampings produced by modern LEAKE techniques for military and civilian purposes. Single copies free when requested on your letterhead. Quantities at nominal cost.



THE LEAKE ORGANIZATION *can furnish metal stampings in* ANY SIZE • ANY THICKNESS • ANY SHAPE • ANY ANALYSIS

THE LEAKE STAMPING COMPANY · MONROE, MICHIGAN

LEAKE

EXPERTS IN PRESSED METAL

COMPLETE PRESSROOM—MACHINE SHOP
HEAT TREAT—BRAZING—WELDING
TESTING AND INSPECTION

New Products and Equipment

Grinder Holds Blade Vertically

USE REPLY CARD—CIRCLE No. 1

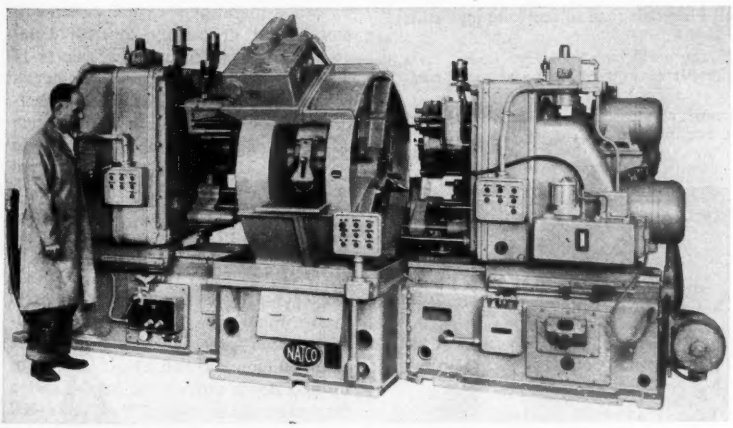
Efficient grinding on external surfaces of aircraft propellor blade hubs, including ball race ways, is done with a grinder developed by Norton Co., Worcester 6, Mass. Accurate and rapid grinding is performed with the blade held in a vertical position by a workholding fixture on an antifriction bearing work spindle. Vertical method cuts down errors brought about by deflection when the blade is held horizontally. Wheel spindle is also of antifriction bearing construction, mounted vertically. Power positioning of the work spindle for ball race grinding operations and power feed of the grinding wheel simplify operation.

85 Transmission Cases per Hour

USE REPLY CARD—CIRCLE No. 2

Combination four-way, horizontal and angular machine developed by National Automatic Tool Co., Richmond, Ind., works 85 transmission cases per hour. In each case, unit drills 10 holes, chamfers 4 holes, combination reams and spot faces 1 hole, reams 1 hole, combination reams and spot faces 2 bosses and taps 8 holes. It consists of a horizontal floor type fixture arranged with fixed center gear driven heads and provided with auxiliary reversing drive tapping units. Heads contain 17 drilling spindles mounted in antifriction bearings.

One single-spindle reversing motor-driven tapping unit is angularly mounted and arranged with hydraulic traverse. One of the company's angularly mounted holeunits, equipped with a single-spindle drill head completes the machine. Other features are hydraulic feed and automatic index for the trunnion fixture. One left hand horizontal unit and the angular holeunit have automatic time-delayed reverse and positive stop.

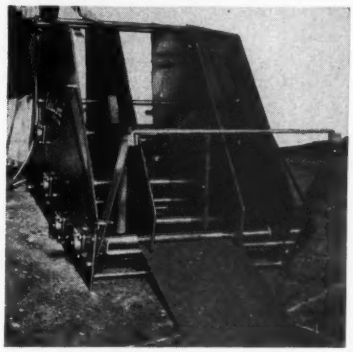


. . . heads contain 17 drilling spindles mounted in antifriction bearings

Automatic Coil Stock Cradle

USE REPLY CARD—CIRCLE No. 3

Added weight and width of coils handled are possible on a 3000-pound capacity cradle available from the standard line of motor driven, automatic coil stock cradles made by Rowe Machinery & Mfg. Co. Inc., 1506 N. Industrial Blvd., Dallas, Tex. The 3000 series takes stock with maximum 48-inch OD and maximum width of 15 inches as standard. Variations in width requirements may be had on quotation within weight capacity of cradle.



. . . handles stock to 3000 pounds

Actuating arm operates on the inside or outside of slack loop, its top bar swinging completely out of the way for loading. Securing bands may be left on coil and removed as coil is revolved gradually by snapping toggle switch. Hardened and ground rolls are mounted in each of the two individually controlled guide plates. Reversing switch is standard equipment; variable pitch sheave is optional.

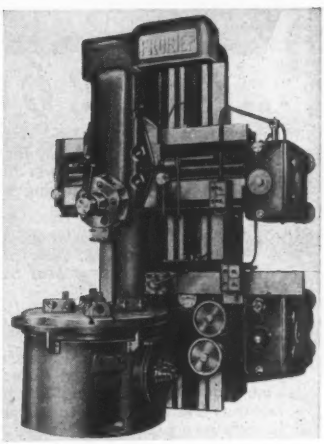
REPLY CARDS

on page 139 will bring you more information on any new products and equipment in this section.

Vertical Mills in Four Sizes

USE REPLY CARD—CIRCLE No. 4

Cosa Corp., 405 Lexington Ave., New York 17, N. Y., is introducing in the United States the Froriep single column vertical boring and turning mill. Machine's column and wide base are bolted rigidly and ribbed heavily for quiet machining, under heaviest loads. Cross rail slide head and side arm head are completely independent, each controlled by an individual set of feed and rapid return gears. Three levers, placed centrally, control geometrically graduated feeds for the tool's vertical and horizontal travel.

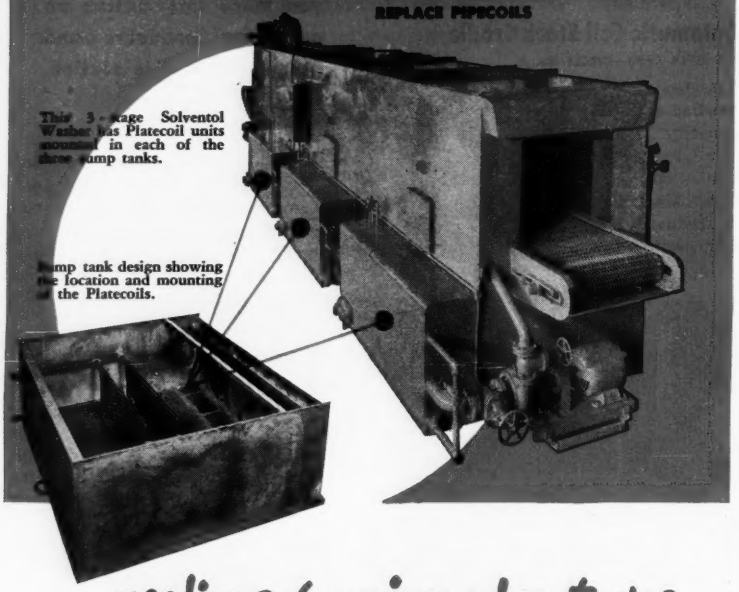


. . . single lever controls feeds and return

Engaging of all feeds and rapid return is effected by single lever control. Fine head adjustment is located on the slide to permit close observation of cutting edge with even

Now! SOLVENTOL CHEMICAL IS SAVING MONEY with PLATECOILS

REPLACE PIPECOILS



This 3-stage Solventol Washer has Platecoil units mounted in each of the three sump tanks.

Sump tank design showing the location and mounting of the Platecoils.

... realizes 6 major advantages

Solventol Chemical Products, Inc., Detroit, Michigan has joined the growing list of manufactures who are saving money by using Platecoils in their products. Use of Platecoils as the heating medium in their 3-stage washer has resulted in 6 major advantages:

1. *Simplified installation.*
2. *Sharply reduced installation costs.*
3. *A higher rate of heat transfer.*
4. *Low first cost.*
5. *Solution flow controlled without baffles.*
6. *Increased sales advantages due to easier maintenance.*

The Platecoils are installed in each of the three sump tanks as shown in the inset picture. The pre-fabricated Platecoil units are installed in but a fraction of the time required for bending and installing pipe coils. That's why most manufacturers find it costs less to buy and install Platecoils than to fabricate pipe coils in their own plant.

In addition, the Platecoils are about 50% more efficient than pipe coils. As a smaller size Platecoil can be used, considerable savings in steel and more compact machine designs are possible.

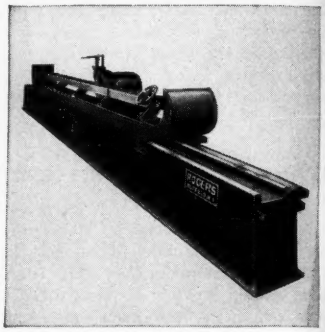
If you're looking for ways to conserve steel and save money, get the facts on Platecoil today. Write for bulletin P72.

the smallest workpieces. Mill is made in four sizes with tables 39, 49, 55 and 63 inches diameter, taking workpieces weighing up to 5 tons. Machine can be furnished with thread cutting and taper turning equipment, tripping or tracing device, with electric tracer control and coolant system.

Grinding Knives to 210 Inches

USE REPLY CARD—CIRCLE No. 5

Samuel C. Rogers & Co., 183-201 Dutton Ave., Buffalo 11, N. Y., offer a heavy-duty knife grinder, one of the 220 series, that precision grinds heavy-duty chipper knives and shear blades to 210 inches in length. The machine is also adaptable for flat



. . . motor speeds are 25-50 feet per minute

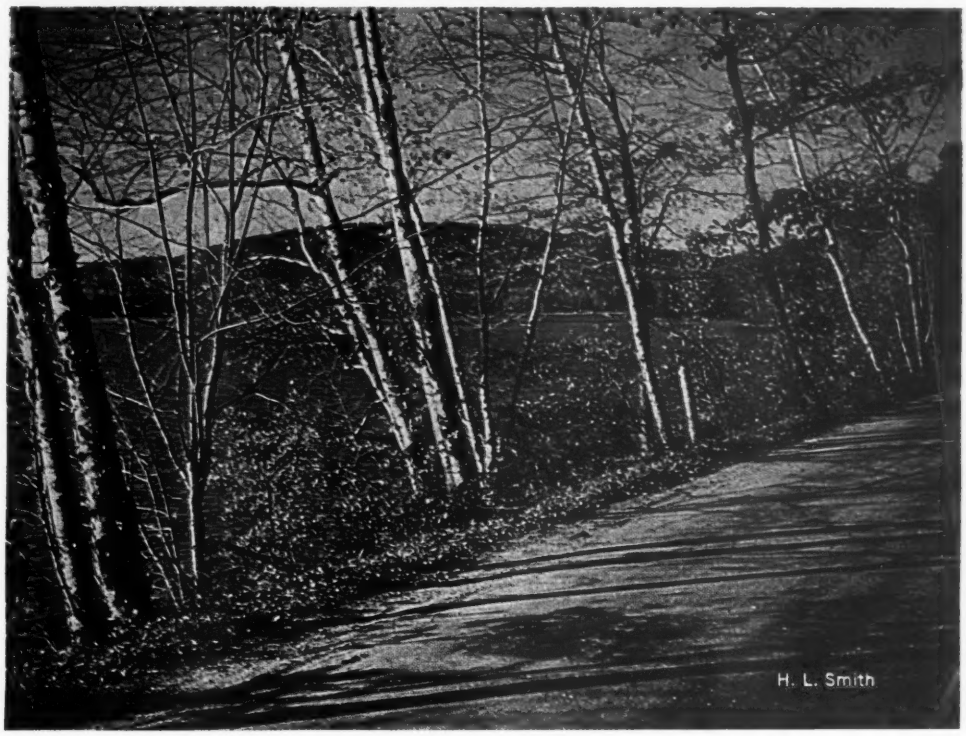
faces and straight edges. Its cabinet base is 30 feet long and the entire unit weighs 10½ tons. Knife bar and table travel over 5-inch V ways, precision machined for smooth table action. Variable speed motor with speeds from 25 to 50 feet per minute drives the table assembly.

Knives are lined up and supported on a 10-inch wide slotted bar affixed to the knife bar by heavy-duty trunnions. Grinding head is fed automatically to the work by a heavy worm gear over machined ways. Cut is adjustable for increments from 0.0002 to 0.006-inch per cycle. Standard motor that drives the 20-inch diameter segmental grinding wheels is 15 hp, however units with larger horsepower ratings are available. Gusher-type water pump delivers maximum of 45 gallons of coolant per minute to the work through a ¾-inch valved outlet.

Guard Has Electric Control

USE REPLY CARD—CIRCLE No. 6

Electric-pneumatic punch press guard, model AE 60, designed for direct clutch presses having not more than 60 pounds pull and 2 inches of up and down movement on the clutch tripping rod, is offered by Tech-n-Kal Machine & Engineering, 12925 Au-



What's in Vermont this month?

AREA OF CONTACT

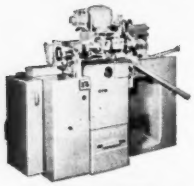
All machine tools depend on proper cutting action of the tool to get the best stock removal rate and best finish. A lathe, for instance, will not function properly if the tool is sharpened with the wrong rake and clearance. Milling cutters must be sharpened so that the cutting edges are presented accurately to the work. The area of contact of the grinding wheel to the work is the crucial point on internal grinding.

The grinding wheel must make a uniform contact for its full width at all times during the grinding cycle. If the contact is poor, it will be impossible to grind to a fine finish; stock removal will be slow, and wheel wear will be excessive.

Area of contact is affected by the shape of the grinding wheel as it is dressed by the diamond; it is affected by the path of the wheel as it is traversed through the work; and it is affected by the relationship of the center lines of the grinding wheel and the work-piece. If these center lines are not parallel and in a common plane, the wheel cannot contact the work uniformly. In brief, a good area of contact can be produced only on a machine which is properly aligned.

Bryant Chucking Grinder Company in Springfield, Vermont, U.S.A.

FOR HOLE GRINDING



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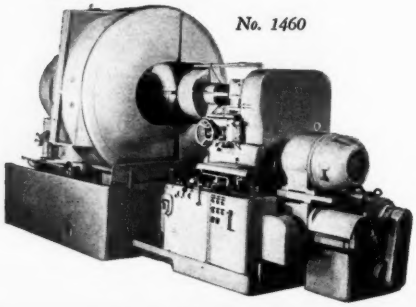


No. 1460

The Bryant Line of Precision Hole Grinders

Since 1909 the Bryant Chucking Grinder Company has specialized in building precision grinders for finishing holes where the part can be held in a chuck. Bryant equipment has always been outstanding for the advanced engineering that has gone into the product and for the research and development which stands behind the engineering. The purpose of the Bryant machines has been to finish holes to maximum precision at a minimum of cost both on the production line and in the tool room. Bryant machines are available to finish holes from thirty-thousandths of an inch to five feet in diameter.

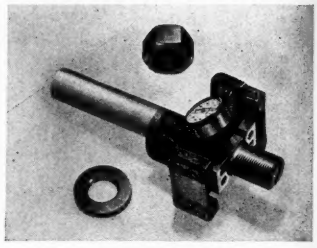
FOR CHECKING THREAD ASSEMBLE-ABILITY

The Bryant Line of Thread Gages

No. 11 GAGE
internal or external from 5/16" to 1"

SQUARENESS-OF-FACE GAGE
for No. 11 Gage

These Bryant Thread Gages give a visual quantitative reading of accuracy within tolerances, or accumulated inaccuracies of lead, pitch diameter and thread form, or the presence of burrs. For the first time, threads may be checked for *assemble-ability* into known classifications for fit. Bryant Gages are built in many standard and special models to handle the inspection of a wide range of threaded parts, both internal and external. Attachments may be provided for checking squareness of face to show relationship of face to pitch diameter. Segments for both external and internal gages are furnished to either GO or NOT GO thread form to "W" tolerances, thus accommodating all classes of fits. Capacities of standard bench models are 3/8" to 5" internal and 3/16" to 5" external; portable models are 7/16" to 3" internal. Write the factory for full information.



No. P-11 PORTABLE GAGE
internal from 5/16" up

No. 2 and No. 3 GAGE
internal and external from 1" to 5"

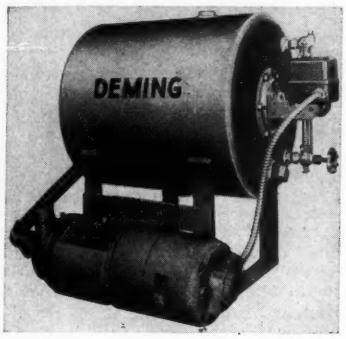
Bryant Chucking Grinder Company in Springfield, Vermont, U.S.A.

burn Ave., Detroit 23, Mich. A set of electric starter buttons is installed on the press far enough apart so that operator must use one hand on each button and circuit is completed only when operator pushes simultaneously on both buttons. When air clutch is engaged, the ram makes one complete revolution in the same manner as when tripped by a foot treadle. Anti-repeat switch and long cam are standard equipment and allow the ram to descend only once unless solenoid valve is re-energized by use of the starter buttons.

Pump Returns Condensate

USE REPLY CARD—CIRCLE No. 7

Condensation return unit that saves fuel by returning condensation from steam coils, radiators or steam operated equipment to the boiler is made by Deming Co., Salem, O. Centrifugal pump employed has enclosed bronze



. . . saves fuel by reclaiming process

impeller and stainless steel shaft. Deep stuffing box has conventional packing rings for grease lubrication. Pump is mounted on legs of the tank and requires no base.

Motor has standard type C mounting flange and is furnished for single phase, two or three phase or direct current. Complete line includes single and duplex units, the latter designed for conditions involving occasional demands in excess of single unit capacity. Selection of 44 unit numbers in both models is designed to handle from 2000 to 40,000 sq ft of radiation.

Jack Is Overload Protector

USE REPLY CARD—CIRCLE No. 8

Hydraulic press jack that protects power presses from overload damage is a development of Dayton Rogers Mfg. Co., 2824 13th Ave. South, Minneapolis 7, Minn. The jack also assures constant working pressure at the point of operation at all times, compensating for variation in the piece part's material thickness. Unit

It might be NEWS
TO YOU

only PRESTOLE builds ALL

SHEET METAL NUTS With a 360° Grip

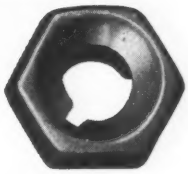
Over 1,000 Shapes and Sizes

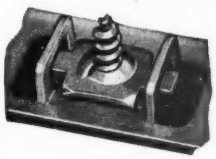
"J" NUT

"J" Nuts—to fit all metal from .020 to .090 thick. Sizes from 6-32 to 5/16 machine and sheet metal screws. Made in all finishes. Same availability on "U" Nuts as "J". All with the conical dome formed with a full 360° locking grip around screw. No prongs to flatten or break.

HEX-LOX

Hex-Lox—the Hex Nut with both the 360° conical thread grip and the side-arm thread grip. Weighs 70% less than conventional lock nuts. Has highest installation torque, prevailing torque, and back off torque. Excells in vibration tests and tensile strength. Made in 5 screw sizes from 6-32 to 1/4-20. SAE-1060 steel .016 to .020 thickness.





CAGE NUT

One-Piece Cage Nuts—combines both nut and cage in one piece. No prongs. Full 360° unbreakable thread grip. Saves material, cuts parts in half, saves handling and assembly time. Made of SAE-1060 steel in all popular sizes.

PUSH ON

Push-Ons—for smooth studs. The PRESTOLE push-on clover leaf nut has also become very popular because of its 4 point spring tension bite on smoothest studs, whether metal, fibre or plastic. All sizes and finishes.

The growing demand for more PRESTOLE fasteners is due largely to its unique, precision engineered conical grip that bites a full 360° into the root of the screw thread. It's in all PRESTOLE fasteners except those made for smooth studs. PRESTOLE fasteners are preferred because of their greater holding power. Hundreds of millions in use on automobiles, trucks, refrigerators, stoves, heaters, radio, TV and scores of other products. In writing for samples, kindly send blueprints or details of application.

FAMOUS FASTENERS

PRESTOLE CORPORATION
1349 MIAMI ST. • TOLEDO 5, OHIO

is fastened directly to bolster plate or press bed frame. Hydropneumatic pumps can be operated directly on the average shop air line. Control valves are set to desired tonnage to give overload protection. Jacks are made in eight sizes, to a maximum of 200 tons.

Steering, Maintenance Eased

USE REPLY CARD—CIRCLE No. 9

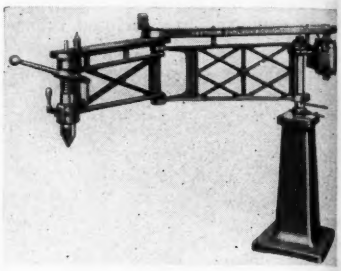
Easier steering and faster maintenance are features of an improved lift truck, the Gas Clipper, made by Industrial Truck Division, Clark Equipment Co., Battle Creek, Mich. Improved steering is gained by using an Elliot-type axle with tie rods in the same plane and more nearly in line with the forces they transmit. Steering knuckles are relocated as close to the tire's dead-center shock point as is practical. Louvers on both sides hinge at the bottom and fold down to expose the engine compartment for minor adjustments. For access to the entire engine, radiator and air breather caps are taken off to remove the hood and seat. An instrument panel mounted on the steering column is now standard equipment. Gas cap is recessed into the dash on all models, completely outside of engine compartment to reduce hazard from spilled gasoline. Redesigned double cylinder tilt system gives better upright stability with more positive control of tilt.

Radial Arm Drills

USE REPLY CARD—CIRCLE No. 10

Two sizes of radial arm drills, 30 and 71 inches, are reinstated in the line of aircraft production equipment made by Ekstrom, Carlson & Co., 1400 Railroad Ave., Rockford, Ill. The units, offered first during World War II, are designed for fast, light drilling and are adaptable for single piece and production runs. Each drill is available in four types.

Type A is mounted as a complete unit on a table or stand. The drill is used at a fixed height only, and



. . . for single piece or production runs

no provision is made for vertical adjustment. Type B has a threaded post and support bracket for mounting on a table or stand and can be adjusted vertically up to 6 inches. Type C is identical to B, except that it has its own cast iron base. All above types have inner spindle assembly that slides within an outer sleeve. Type D can be equipped with any of the three above mountings, but has no outer sleeve and inner spindle assembly. Instead, its entire spindle assembly is actuated manually with a four-spoke hand lever by a rack pinion arrangement. Adjustable coil spring counterbalances down stroke facilitating rapid return of drill spindle to up position. Standard type D spindle speeds are 2500 and 4000 rpm. All models except D can be supplied with a gravity-feed drill lubricating system.

Precision Tapping, Threading

USE REPLY CARD—CIRCLE No. 11

Five sizes of precision automatic tapping and threading machines made by Karl Huller, Ludwigsburg, Germany, are offered for U. S. sale by Carl Hirschmann Co., Manhasset, N. Y.

All are made for mass production; operation cycles are entirely auto-

Is Your Rail Haulage —all or in part—INDOORS?

This 8-Ton, 36" Gauge, Davenport Diesel Mechanical Locomotive is in Steel Mill Service in Colombia, S.A. It is equipped with Caterpillar D-318 Engine and with Flame Arrestor and Water Wash Muffler System.

DAVENPORT LOCOMOTIVES — Available in STEAM FIRELESS GASOLINE DIESEL with ELECTRIC or HYDRAULIC or MECHANICAL DRIVE

PORTER "Davenport Built" LOCOMOTIVES Established 1866

Many modern industrial plants make use of rails within their buildings as well as out of doors. This is now practical, sensible and profitable with Davenport—or Porter—Locomotives especially designed for the purpose. If you are interested, it will be a pleasure to supply such technical information as you may require for a full appreciation of "indoor rail haulage".

WE MEET YOUR REQUIREMENTS

Whatever your operating conditions or work to be accomplished we can supply a size and type of Davenport or Porter Locomotive to exactly fit your wheels. Send us a description of your proposed operations; we will gladly submit recommendations—without obligation.

WRITE US TODAY

Complete Information on Request

DAVENPORT LOCOMOTIVE Division
DAVENPORT BESLER CORPORATION
DAVENPORT IOWA, U.S.A.

EXPORT OFFICE • 50 CHURCH STREET, NEW YORK 7 • CABLE ADDRESS "BROSITES"

PRESSING ...

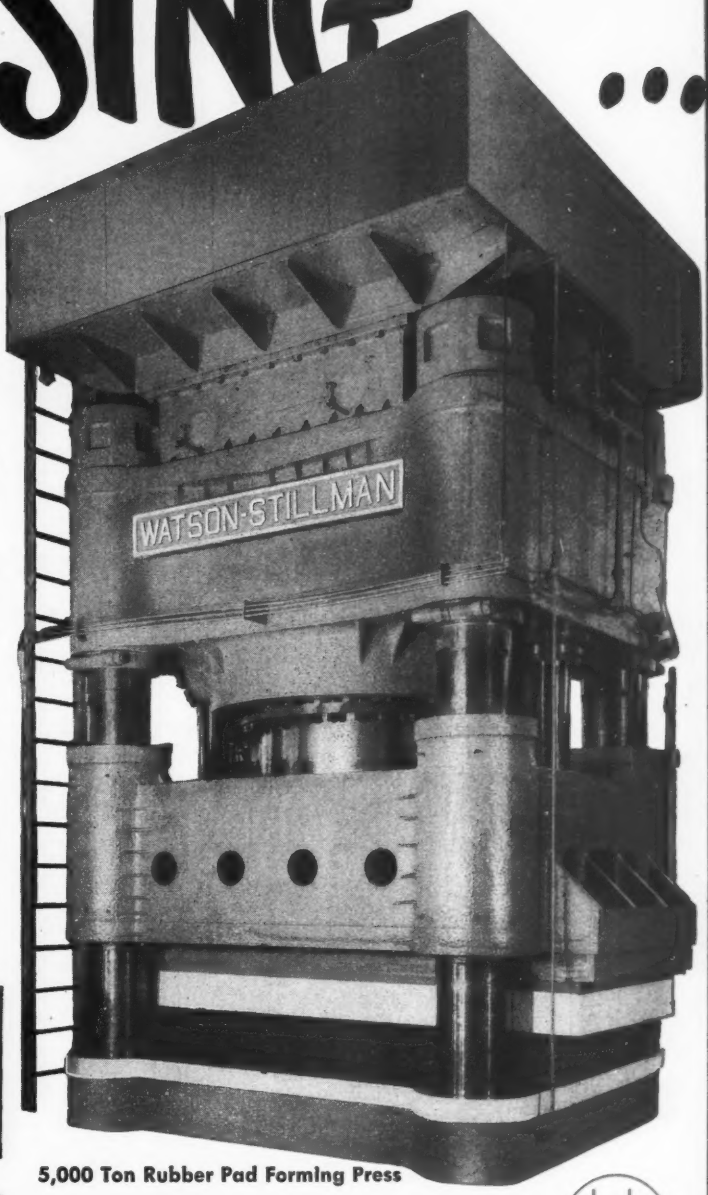
out the ARMS for UNCLE SAM!

Planes ... tanks ... guns ... shells ... shell cases or any one of a thousand and one other items that must be produced, as long as it can be pressed out of metal, there's a W-S Press to do the job ... and more economically, too.

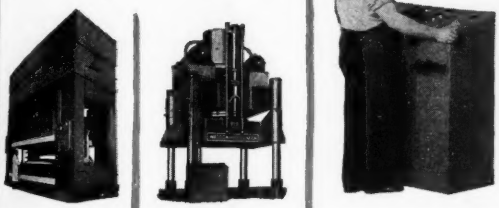
W-S Medium and Deep Draw Presses do things faster. Rejects are virtually eliminated ... present dies and materials can be used ... one or more draws may be cut from a progressive operation, thereby saving man hours on the job ... intermediate annealing is often reduced or eliminated and total production time cut down.

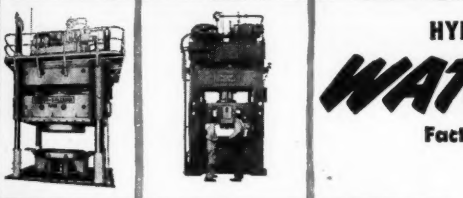
Designed for precision work and built for long service, these W-S Hydraulic Presses offer further advantages in set-up, maintenance and tool life. Available in a large choice of pumping units and controls. It will pay you to investigate their flexibility.

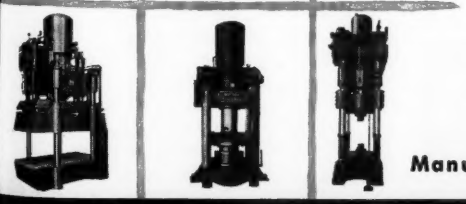
Other W-S Metal Working Presses include those for Forming, Flanging, Trimming, Forging, Coining, Hobbing, Extruding, Briquetting, Bending and Straightening.



5,000 Ton Rubber Pad Forming Press







HYDRAULIC MACHINERY DIVISION

WATSON-STILLMAN

Established 1848

Factory and Main Office: 167 Aldene Rd., Roselle, New Jersey

Branch Office: 228 No. La Salle St., Chicago, Illinois

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Rochester 12, N. Y.....Watson-Stillman Co.
San Francisco 7, Cal. . Schellenbach Mach. Tool Co.
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St. Paul 4, Minn.....Anderson Machine Tool Co.

Manufactured in Canada by—CANADIAN VICKERS, Ltd., Montreal

W-S "COMPLETELINE" HYDRAULICS ... THE SHORTEST DISTANCE FROM PRODUCTION TO PROFITS

9-1-17

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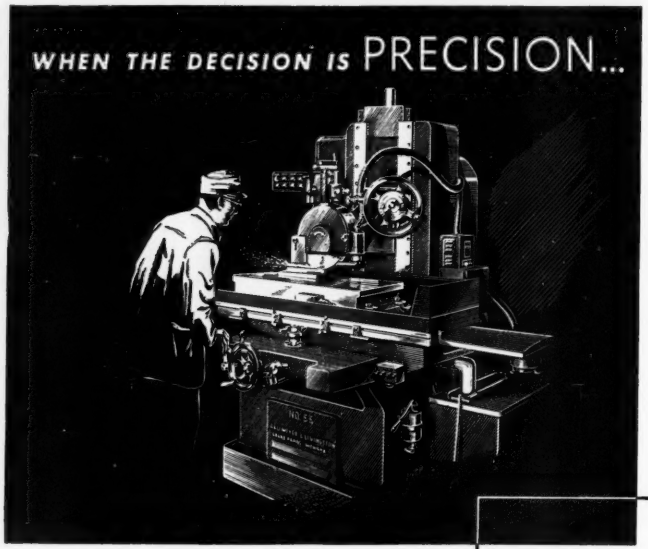
EASTON ...a dependable design and construction service in industrial cars

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA. • NEW YORK • PHILADELPHIA • PITTSBURGH

WHEN THE DECISION IS PRECISION...



Where extreme tolerances are not required, the choice of any particular grinding machine may not be too important. But, where absolute precision is demanded, the choice is usually *Grand Rapids.*

Defense orders make it impossible to fill orders as quickly as we desire—but we know our customers can appreciate the reasons for delay. As always we'll do our best to serve you.

GALLMEYER & LIVINGSTON CO.
307 Straight Ave., Grand Rapids, Mich.

Grand Rapids Grinders
—World's finest

GALLMEYER & LIVINGSTON

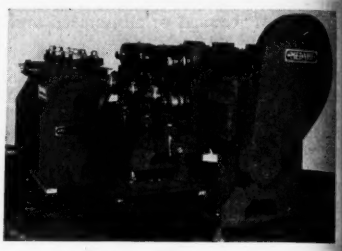
matic. Machines have positive electrical controls, exact limitation of feed depth and wide range of speeds. Smallest of the units, type UG O, is designed for cutting the smallest threads, such as are used in electrical and instrument making. Of the four other types, maximum thread cut in steel ranges from 3/16 to 1-3/16-inch; in brass, from 5/16 to 1-1/2-inch.

The chuck capacities on the four larger models are 0 to 15/64, 5/32 to 7/16, 3/16 to 5/8, and 1/4 to 1 inch. Maximum spindle travels are 1-1/2, 2-3/16, 3-1/8 and 4 inches. Throat depth ranges from 4¾ inches to 11¾ inches.

Two-Plane Shape Straightener

USE REPLY CARD—CIRCLE No. 12

Two-plane shape straightener, model TPOMVC, with overhung-mounted variable-center rolls is offered by Medart Co., 3535 DeKalb St., St. Louis 18, Mo. Straightener combines advantages of rapid setup found in overhung roll type with fine control of bending stresses possible in variable



. . . variable center rolls add versatility

center unit. Variable center rolls permit versatility in adjustment of bending spans required for handling a variety of shapes and sizes. Bending span adjustment, possible with movable roll housings, also prevents bearing overload and promises greater accuracy in straightening operations.

Cross-rolling or reforming cross sections of distorted extrusions or other shapes can be accomplished simultaneously with straightening action by moving the bottom rolls directly under top rolls. Rolls in this position also serve as additional pinch-feed equipment to give extra traction for straightening difficult shapes. All rolls are alloy steel, hardened and ground; gears run in oil within enclosed housings. Pinch feed rolls at the end are air operated.

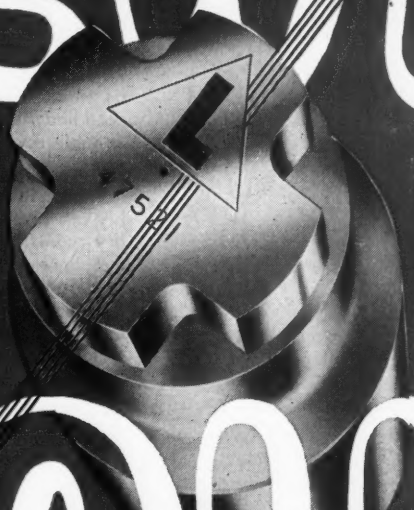
Balance Is Fast, Clear

USE REPLY CARD—CIRCLE No. 13

Fast, repetitive weighing or regular laboratory work are operations suited to the model AB-1, an addition to the line of redesigned balances made by Christian Becker Division, Tor-

The name and Roll mark that identify Quality Rolls . . .

LEWIS ROLLS



OVER 90 YEARS LEWIS OF ROLL MAKING

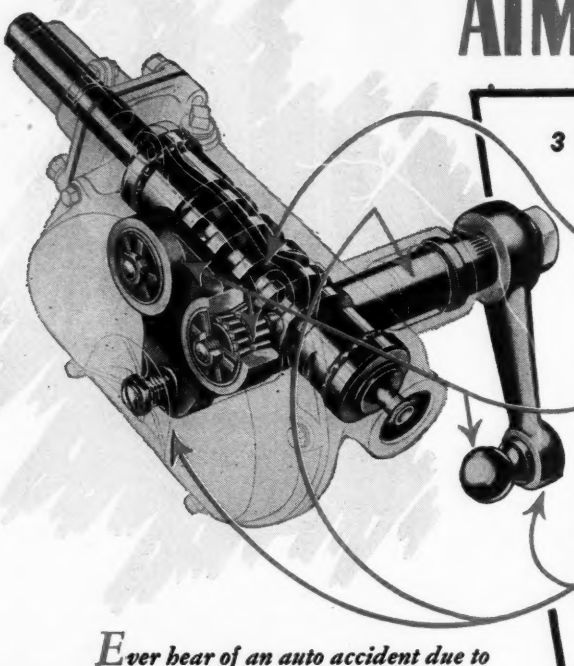
PLAIN CHILLED IRON ROLLS • MOLYBDENUM CHILLED IRON ROLLS • "X" & "XA" ROLLS • SUPERIOR "X" ROLLS • ATLAS & ATLAS "B" ROLLS • SPECIAL PROCESS ROLLS • AJAX DUPLEX ROLLS • CLIMAX & AJAX ROLLS • SPECIAL TUBE MILL ROLLS

MANUFACTURERS OF ROLLS AND ROLLING MILL EQUIPMENT FOR THE IRON, STEEL AND NON-FERROUS INDUSTRIES

LEWIS FOUNDRY AND MACHINE DIVISION OF BLAW-KNOX COMPANY • PITTSBURGH, PA.

There's Long, Hard Wear in STEERING GEARS

...PUT THERE BY 'SURFACE' RX PREPARED ATMOSPHERES



3 Controlled Atmospheres for Heat Treating

Work flow in the plant producing this steering gear is arranged around 3 controlled atmosphere processes: *carburizing, dry cyaniding, clean hardening.*

- **Carburizing:** Steering gear cams, the "heart" of the assembly, are carburized in 4 'Surface' pit type radiant tube furnaces each with an enriched RX controlled atmosphere. Each furnace handles about 1500 lbs. net. Minimum hardenable case depth of 0.040-in.
- **Dry Cyaniding:** Studs and balls subject to frictional wear and impact stress in final assembly are given optimum physical properties by a dry cyaniding treatment with a 'Surface' RX atmosphere enriched with natural gas and ammonia. Studs are cyanided to case depth of 0.008-in. Balls are treated to case depth of 0.010-0.015-in. Heat treatments are accomplished in a continuous articulated link belt furnace.
- **Clean Hardening:** Lever shafts and steering arms are first isothermally annealed, then clean hardened in a 'Surface' rotary hearth furnace with radiant tubes and an RX controlled protective atmosphere.

Ever hear of an auto accident due to steering gear going bad? Quite likely you never will, because right before your eyes is proof that steering mechanisms (other parts and products, too) are made safe and dependable.

All vital and moving parts of the steering assembly shown above undergo one or more controlled atmosphere heat treatments: *carburizing, cyaniding, clean hardening,* where results are uniform and consistently within close tolerances.

These controlled atmosphere heat treatments are carried out in radiant tube-fired furnaces of types best suited for handling the particular parts. The furnace types include pit, rotary hearth and continuous articulated link belt types.

RX PREPARED ATMOSPHERES

Atmospheres for these 3 distinctly different heat treat processes are prepared in 2 centrally located 'Surface' RX generators manifolding the RX carrier gas for all atmosphere requirements. Saves money, saves space!

'Surface' RX generators for making prepared atmospheres are employed successfully in hundreds of plants for many processes: carburizing, clean hardening, bright annealing, carbon restoration, homogeneous carburizing and dry cyaniding.

'Surface' is a pioneer in prepared atmosphere equipment, furnishing not only RX, but also DX, NX, HX, HNX, AX and Char-Mo gas atmospheres. *Send for Bulletin SC-155 on prepared atmospheres. Write today on your letterhead.*

'Surface'
INDUSTRIAL FURNACES

SURFACE COMBUSTION CORPORATION • TOLEDO 1, OHIO

sion Balance Co., Clifton, N. J. Optical system of precision-ground lenses project a clear sharp image on a screen positioned for ease and readability. A lamp behind the heat-insulated back panel is projected through a transparent micro scale. Light is automatically switched on and off as beam is released and arrested. Vernier on the screen provides direct positive readings from 1/10 to 100 milligrams each side of the center zero. Automatic dampers at each end of the beam arrest oscillation quickly, further speeding positive reading.

Five Units Added to Lift Line

USE REPLY CARD—CIRCLE No. 14

Towmotor Corp., 1226 E. 152nd St., Cleveland 10, O., announces five models added to its line of industrial trucks. Three of the models, replacing trucks formerly produced, have solid or cushion tires and a shorter wheel base to increase maneuverability; models 480-P and 400-P are equipped with pneumatic tires. The former has 48-inch wheel base, a capacity of 4000 pounds and a 24-inch load center. The latter's wheel base is 40 inches and its capacity is 2000 pounds at a 24-inch load center.

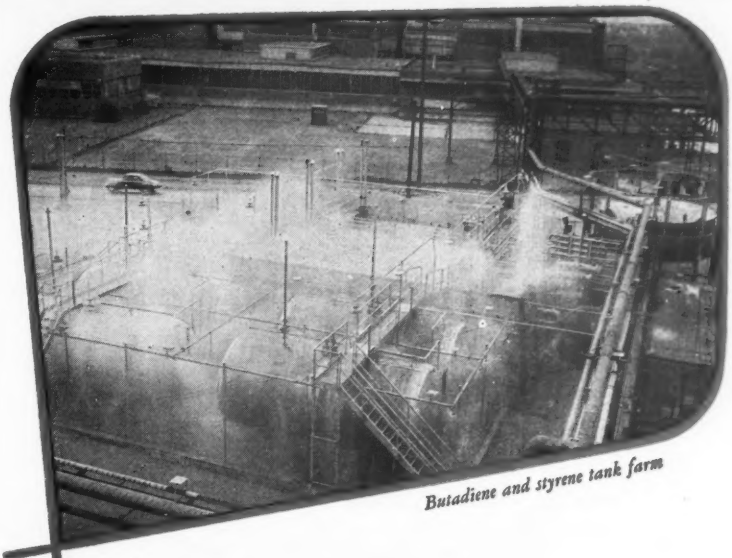
Model 390 has a 39-inch wheel base, a capacity of 3000 pounds at 15-inch load center; model 420 has a 42-inch wheel base and a 4000-pound capacity at 15-inch load center; and model 460 has a 46-inch wheelbase and capacity 4000 pounds at 24-inch load center.

Trolley Brakes Eliminated

USE REPLY CARD—CIRCLE No. 15

Motor driven trolley made by Philadelphia Division, Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa., eliminates trolley brakes and complex electrical speed changing equipment. Improvements are effected through a hydraulic coupling that transmits power from motor to the drive unit through a cushion of oil. Low hoist maintenance costs, increased load and operator's safety are other results of the application of fluid transmission to hoisting equipment.

Trolley motor starts unloaded; comes up to 85 per cent of full speed before starting the load to avoid prolonged inrush of current. Power requirements are less than one-half normal with accompanying reduction in motor heating and maintenance. Fluid coupling replaces accelerating speed control to cut maintenance costs of the more complex equipment. Through smoother acceleration, swinging or pendulum action of the load is reduced and open con-



Butadiene and styrene tank farm

This SPECIAL HAZARD fire protection safeguards chemical processing operations

Most manufacturing plants and many industrial and commercial business operations present certain areas of extreme fire hazard that are not adequately safeguarded through standard methods of fire protection. The chemical processing and storage operation shown is one such case. At this location, *Automatic* **FIRE-FOG** systems of protection detect and dissipate concentrations of vapors above the lower explosive limit. This type of protection assures the maximum in personnel and fire safety, preservation of high-valued equipment and continuity of plant operations.

Like all SPECIAL HAZARD systems, *Automatic* **FIRE-FOG** is specifically engineered for the risk that is protected. Many other installations of similar nature have been made in chemical processing properties throughout the world. And, like any other worth-while product, **FIRE-FOG** stands on its records of achievement . . . records that are written into the reports of all leading insurance bureaus.

Regardless of your SPECIAL HAZARD requirements, you'll find that our preliminary engineering service makes possible a fair economic and adaptability evaluation of all fire protection methods for your own risk. This engineering service plus the facilities of our laboratory and test yard is available to you without cost or obligation.

If yours is a special condition—we either have the fire safety answer, or will use our entire facilities to find the answer. Write or call us today

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN 1, OHIO

"Automatic" Sprinkler

FIRST IN FIRE PROTECTION

DEVELOPMENT . ENGINEERING MANUFACTURE . INSTALLATION

OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

NO need to say

"OUR LINE IS DOWN"

Get Them From

CAMCAR

SPECIALS • SEMS • THREAD CUTTERS
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In All Cold-Heading Materials

Camcar's business is supply!

We do make all kinds of special metal parts, fasteners and screws — of steel, brass, bronze, aluminum, stainless and all cold-heading materials — tested for strength, ductility, non-corrosion and practically all conditions necessary to give you service, cost and quality advantages.

But if you don't have these parts when you need them for assembly, none of these advantages will be important to you.

That's why we say, "Consider Supply First". Hundreds of Camcar Specialists are working every day for this one purpose . . . to keep assembly lines open . . . to demonstrate to you that there's never a need to say, "Our Line Is Down".

When you need Fasteners or Special Parts . . .

Telephone 5-9451 or Teletype RK-53

CAMCAR SCREW & MFG. CORP.

603 Eighteenth Avenue, Rockford, Illinois

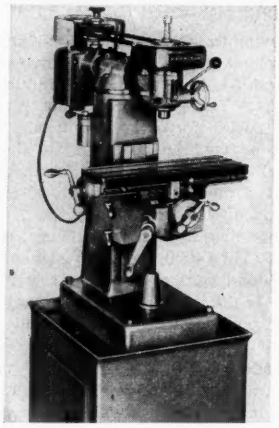
"Production-Designed FOR YOUR ASSEMBLY LINE"

tainers of liquid are less likely to spill. Fluid coupling is available for all the company's power driven trolleys from ⅛ to 12-ton capacity.

Vertical Milling Machine

USE REPLY CARD—CIRCLE No. 16

Wide range of operation is possible on a vertical milling machine made by Johansson & Windle Co., 6015 Dalin Dr., Skokie, Ill. Machine's feed screws are precision ground and mounted in preloaded ball bearings. Large dials are 3-3/16 inches diameter graduated into 100 increments. Milling unit with 1725 rpm motor,



. . . spindle speeds available to 3250 rpm

included in the machine, provides spindle speeds of 180 to 1000, 350 to 1900 and 600 to 3250 rpm. Quill travel is 2-1/16 inches.

Handle and wheel feed are provided for drilling and boring operations. Other features are a positive quill lock and micrometer depth stop graduated in thousandths of an inch. Longitudinal feed is 12 inches; cross feed, 4¼ inches; vertical feed of knee, 12 inches. Maximum distance from spindle to table is 12 inches; minimum distance spindle to table, 0 inches; and maximum distance spindle to column, 8¾ inches.

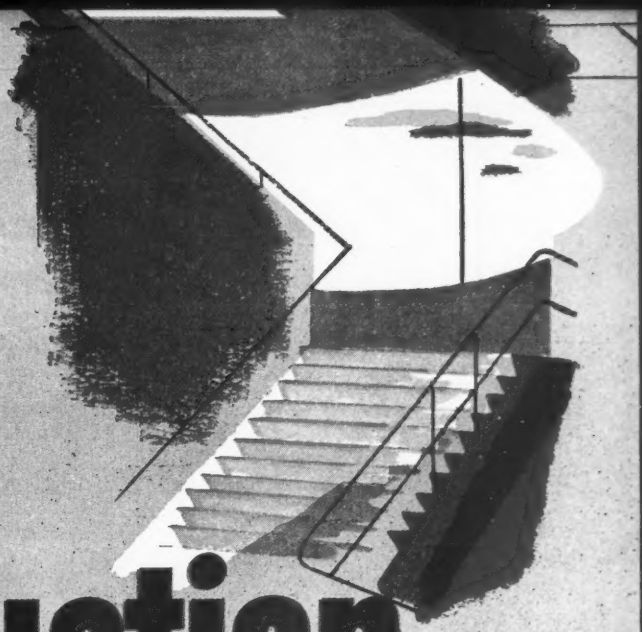
Control Unit Shows Pressure

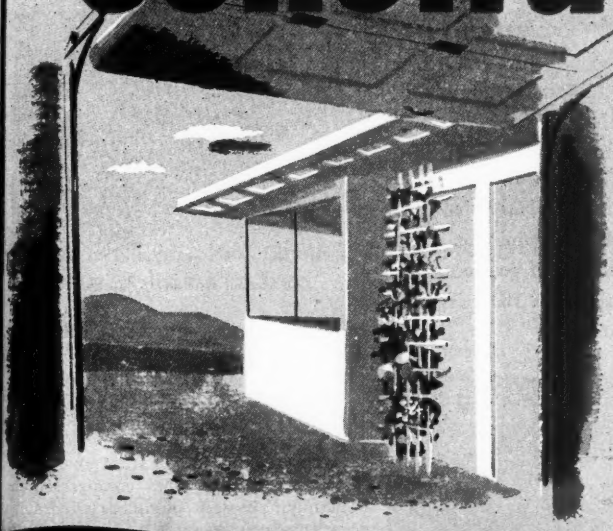
USE REPLY CARD—CIRCLE No. 17

An electronic control system, developed by Henry G. Dietz Co., 12-16 Astoria Blvd., Long Island City 2, N. Y., indicates and controls the differential pressure between volume of corrosive gas and a surrounding gas. In operation its sensing element notes a signal according to the variation in differential pressure. This produces visual indication on the indicating control unit located at 100 to 250 feet from the sensing element. Control unit, in addition to its func-

Van Huffel
cold-formed metal shapes
and tubing are basic
in better

building construction





Whether hidden from sight doing a functional job or exposed to view just looking pretty, you'll find Van Huffel serving modern building construction needs in practically every nook and corner.

Architects, designers and engineers, knowing the structural advantages and versatility of Van Huffel metal shapes and tubing applications, are continually thinking up new uses. Wherever strength without excessive weight . . . beauty without complicated assembly are necessary characteristics, Van Huffel is basic in better building construction.

VAN HUFFEL

TUBE CORPORATION • WARREN, OHIO

ILDED, LOCK SEAM, OPEN SEAM, BUTTED TUBING, SHAPES AND MOULDINGS

"Buffalo" BILLET SHEAR Speeds up the job at INTERNATIONAL HARVESTER

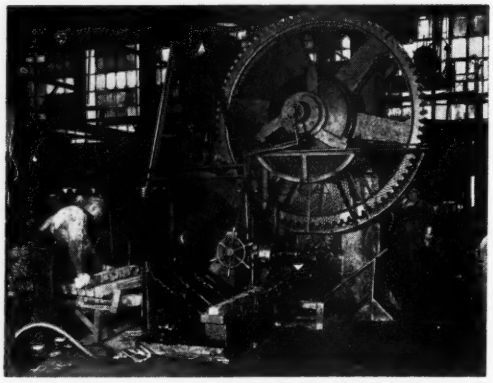
8 CLEAN, QUICK CUTS PER MINUTE!

Here's the kind of speed that brings unit costs down. This "Buffalo" Billet Shear, shown shearing 3-inch alloy steel at the Fort Wayne Works truck plant of the International Harvester Company, operates at 8 strokes per minute. Rear view is shown. Cuts are clean. If you're looking for a faster way to cut billets and flat bars, look into "Buffalo" Billet Shears.

WRITE FOR BULLETIN 3295-A

•

11 SIZES TO CHOOSE FROM!



At right, rear view of "Buffalo" No. 15 Billet Shear cutting round cornered squares at a famous automobile plant.

BUFFALO "Buffalo" FORGE COMPANY
158 Mortimer St. Buffalo, New York
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

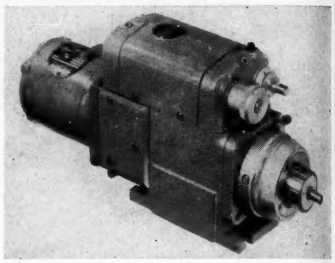
DRILLING PUNCHING CUTTING SHEARING BENDING

tion as a visual indicator, is a two position controller that closes a set of contacts when differential pressure drops below a predetermined value. Variation of pressure differential necessary for operating contact points is provided by a manual control on the indicating control unit. This control system, with proper modifications of sensing element, can be adjusted to indicate linear movement.

Air Hydraulic Drill Unit

USE REPLY CARD—CIRCLE No. 18

Delta Power Tool Division, Rockwell Mfg. Co., 600 E. Vienna Ave., Milwaukee 1, Wis., offers its Delta 19-150 air hydraulic drill unit. The drill's applications range through drilling, reaming, tapping, chamfering, spot facing and centering. As a basic unit, the model is adaptable to special machines, where infinite feeds eliminate need for cams and permit rapid adjustment to suit requirements needed for each operation. Because of built-in switches, a group of the units can be mounted on a framework and interlocked electrically with the fixtures to become a special machine.



. . . on special machines, no need for cams

Thrust is obtained from energy received from the plant compressed air supply. Sealed pumpless hydraulic system provides feed control; depth controls are adjustable positive stops. Controls for feed, length of rapid traverse and final depth are grouped at front of the unit and all are infinitely variable for their entire range. Feed control varies from 0 to 70 inches per minute by means of a metering valve.

Welding Head Is Automatic

USE REPLY CARD—CIRCLE No. 19

Automatic control of both welding head and positioner are features of model 944 welding head made by Mir-O-Col Alloy Co. Inc., 312 North Ave. 21, Los Angeles 31, Calif. Operation of the high-frequency pilot unit, if one is used, is also automatic. Electromechanical control circuit au-

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for immediate delivery

The least expensive BORON alloying agent available

BOROSIL contains 2% to 4% Boron, 40% to 45% Silicon, and the balance is iron.

Borosil is a proven alloy for open hearth production of Boron treated steels and will conserve many tons of the more critical alloying elements for you.

It is available for immediate delivery with every assurance of a continuing source of supply.

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MINNEAPOLIS AREA — Foundry Supply Company, Minneapolis, Minnesota.

MEXICO — Casco S. de R. L., Apartado Postal 1030, Calle Atenas 32-13, Mexico, D. F., Mexico.

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NORTHWEST AREA — E. A. Wilcox Company, Arctic Building, Seattle 4, Washington; Phone Mutual 1468.

BIRMINGHAM DISTRICT—Schuler Equipment Company, First National Building, Birmingham, Alabama.

ANOTHER *High Speed Production Machine*

Fig. 1.
"Dempster Balester" for Baling Scrap Metal.

Built with MEEHANITE CASTINGS

Take *YOUR* Casting Problem To A MEEHANITE FOUNDRY

The equipment (Fig. 1) known as the "Dempster Balester", built by Dempster Brothers, Inc., Knoxville, Tennessee, is setting production records in its function of baling scrap metals into heavy, high density bales. Built into this machine are Meehanite castings which take the full force of the compressive mechanism. These are: Ⓐ Main Gathering Ram Cylinder; Ⓑ Side Compression Cylinder.

In analyzing the requirements of the double acting cylinders demanded by the design, it was apparent that unusually high property values were needed. These were high tensile strength, toughness; a uniform, dense, pressure-tight and machinable structure. Also bores and cylinder flanges needed an extremely fine "mirror surface." As a result, Meehanite castings were specified and have provided all these engineering characteristics.

If you today are harassed by critical material and alloy shortages and it seems impossible to meet your quality specifications, investigate the possibility of Meehanite castings solving your problems.

American Brake Shoe Co.	Mahwah, New Jersey
The American Laundry Machinery Co.	Rochester, New York
Atlas Foundry Co.	Detroit, Michigan
Banner Iron Works	St. Louis, Missouri
Barnett Foundry & Machine Co.	Irvington, New Jersey
E. W. Bliss Co.	Hastings, Mich. and Canton, O.
Builders Iron Foundry	Providence, Rhode Island
Continental Gin Co.	Birmingham, Alabama
Crawford & Doherty Foundry Co.	Portland, Oregon
The Cooper-Bessemer Corp.	Mt. Vernon, Ohio and Grove City, Pa.
Empire Pattern & Foundry Co.	Tulsa, Oklahoma
Farrel-Birmingham Co., Inc.	Ansonia, Connecticut
Florence Pipe Foundry & Machine Co.	Florence, New Jersey
Fulton Foundry & Machine Co., Inc.	Cleveland, Ohio
General Foundry & Manufacturing Co.	Flint, Michigan
Greenlee Foundry Co.	Chicago, Illinois
The Hamilton Foundry & Machine Co.	Hamilton, Ohio
Hardinge Company, Inc.	New York, New York
Hardinge Manufacturing Co.	York, Pennsylvania
Johnstone Foundries, Inc.	Grove City, Pennsylvania
Kanawha Manufacturing Co.	Charleston, West Virginia
Lincoln Foundry Corp.	Los Angeles, California
E. Long Ltd.	Orillia, Ontario
Otis Elevator Co., Ltd.	Hamilton, Ontario
The Henry Perkins Co.	Bridgewater, Massachusetts
Pohlman Foundry Co., Inc.	Buffalo, New York
Rosedale Foundry & Machine Co.	Pittsburgh, Pennsylvania
Ross-Meehan Foundries	Chattanooga, Tennessee
Shenango-Penn Mold Co.	Dover, Ohio
Sonith Industries, Inc.	Indianapolis, Ind.
Standard Foundry Co.	Worcester, Massachusetts
The Stearns-Roger Manufacturing Co.	Denver, Colorado
Traylor Engineering & Mfg. Co.	Allentown, Pennsylvania
Valley Iron Works, Inc.	St. Paul, Minnesota
Vulcan Foundry Co.	Oakland, California
Warren Foundry & Pipe Corporation	Phillipsburg, New Jersey

"This advertisement sponsored by foundries listed above."

25th Anniversary METALL 1926-1951

MEEHANITE®

NEW ROCHELLE, NEW YORK

tomatically stops both head and positioner drives when arc is broken or electrodes stick to workpiece. High-frequency is cut off instantly when arc is established.

Driving motor, designed by the company especially for the head, operates on both the welding voltage and a separate 100-v source. It is independent of the positioner and welding transformer power supply, eliminating phasing problems. Feed rolls are adjustable quickly without removal from the drive shaft to accommodate any electrode size from ⅛ to ⅜-inch. Voltage and current meters are standard equipment; maximum current capacity is 2000 amp.

Key Operated Selector Switch

USE REPLY CARD—CIRCLE No. 20

Class 9001 type TSK key operated selector switch is announced by Square D Co., Milwaukee 12, Wis. It is available as a two or three-position switch with a variety of cams and contact blocks to meet the switching requirements of practically any application.

Speed Chuck

USE REPLY CARD—CIRCLE No. 21

Standard Hampton speed chuck, available from Wallace Pawley Enterprises, Los Angeles 11, Calif., has a wide capacity range that handles all shapes of stock with same jaws and permits individual jaw adjustment for zeroing runout, or compensating for wear as it occurs. Each of the three jaws is capable of individual adjustment over its full capacity range.

Filter Removes Water

USE REPLY CARD—CIRCLE No. 22

Because of its extra size and extended surface, the compressed air line filter offered by Air-Line Engineering Co., Cleveland, O., also functions as a condenser. Known as Airlenco, it has a steel outer shell 6 inches in diameter and 36 inches long and a steel inner cartridge 5 inches in diameter by 24 inches long, loosely packed with Fiberglas.

Coil Grab

USE REPLY CARD—CIRCLE No. 23

One operator using the coil grab introduced by Dixon Research Inc., Rockford, Ill., can lift the coil from pallet up to a vertical position in one motion. A prong tapered to fit between coils, in space made by coil bands, is positioned while opposite jaw is placed in center of coil. As crane lifts, grab automatically adjusts to coil and prong slides between coils. As coil lifts, grab turns to allow coil to move to vertical position, locked by its own weight.

Large Size Photocopying Unit

USE REPLY CARD—CIRCLE No. 24

Vacuum Seal Portagraph, a contact printer made by Remington Rand Inc., New York 10, N. Y., comes in two models, one with a copy surface area of 30 x 42 inches and the other with a 42 x 60-inch area. Unit features a single set of white lamps which provide all the varying degrees of light intensity required in contact printing. The lamp layout operating on a single circuit by a rheostat control furnishes proper lighting for each individual type of reproduction.

Move Objects at All Angles

USE REPLY CARD—CIRCLE No. 25

Ball transfers, available from Mathews Conveyer Co., Ellwood City, Pa., are designed to move objects at all angles. They are made in five basic types. Type 101 (capacity 50 pounds) and 201A (capacity 100 pounds) are usually welded or bolted to steel plates to form a table on which ma-

NO RAVAGING HEAT
robs these record-speed presses of full productive capacity

Day in and day out, double shift production of 1260 deep drawn stainless steel pieces per press per hour . . . that's the record of a battery of six of these Lake Erie double action hydraulic presses in the plant of a leading automotive equipment manufacturer.

Safeguarding the hydraulic power of each of these 300-ton capacity giants, by effectively controlling oil temperatures, are Ross Type BCF Exchangers.

By factory-equipping its presses with these compact, fully standardized all-copper and copper alloy Ross units, Lake Erie Engineering Corp. assures its customers of best possible protection against pump slippage and breakdown of vital oil properties by keeping oil temperature within safe and effective limits . . . an important way to maintain continuous, full-productive capacity.

Write for illustrated Broadside 1.1K4 picturing Ross Exchanger applications on the nation's leading hydraulic equipment.

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EXCHANGERS

ROSS HEATER & MFG. CO., INC.
Division of American Radiator & Standard Sanitary corporation
1431 WEST AVE. BUFFALO 13, N. Y.
In Canada, Horton Steel Works, Limited, Fort Erie, Ont.

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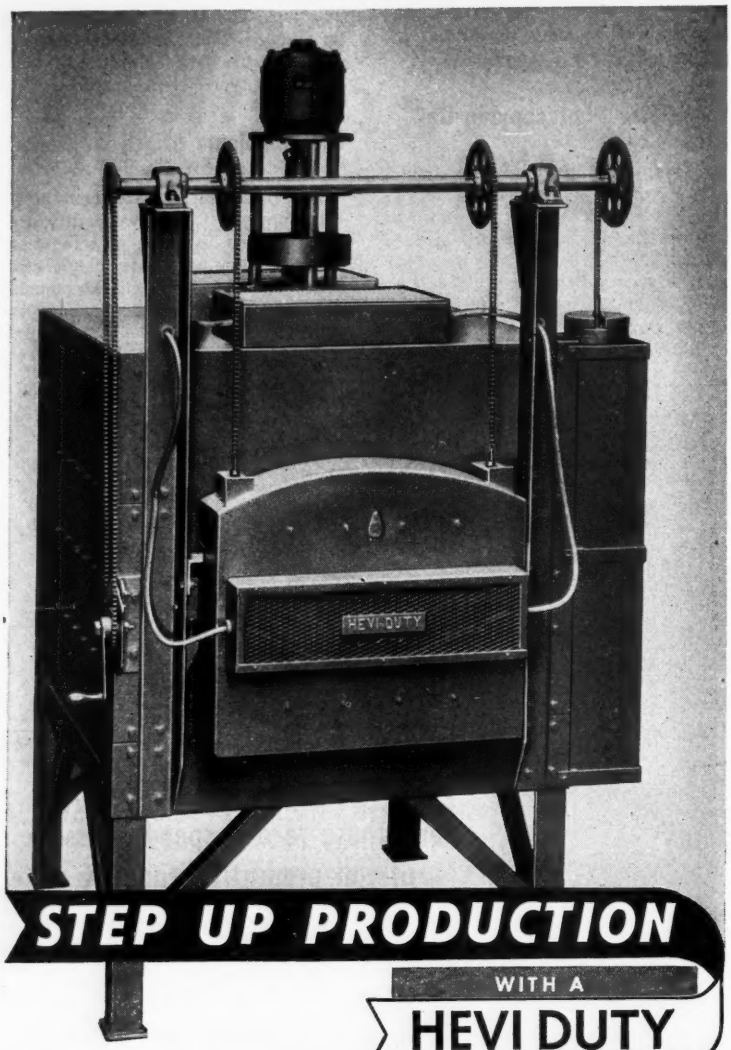

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WITH A

HEVI DUTY

Multi-Range

BOX TYPE

Convection

FURNACE

For Uniform Temperatures

400° F. to 1850° F.

Here is an all-purpose furnace with a wide range of temperatures and high degree of uniformity. These furnaces are equipped with powerful centrifugal type alloy fans designed to operate throughout all working temperatures.

Hevi Duty Multi-Range furnaces are especially suitable for drawing, tempering, and annealing of non-ferrous metals, aluminum brazing, annealing cast iron, normalizing and hardening of steels either with or without a protective atmosphere.

Write for bulletin HD 341

HEVI DUTY ELECTRIC COMPANY

HEAT TREATING FURNACES HEVI DUTY ELECTRIC EXCLUSIVELY

DRY TYPE TRANSFORMERS — CONSTANT CURRENT REGULATORS

MILWAUKEE 1, WISCONSIN

terials can be moved in any direction. Type 202A (capacity 100 pounds), 501 (capacity 250 pounds) and 750 (capacity 650 pounds), are threaded onto ends of pipe mountings.

Disk Type Magnetic Brake

USE REPLY CARD—CIRCLE No. 26

Dings Brakes Inc., Milwaukee 48, Wis., announces a line of alternating or direct current direct acting disk type magnetic brakes. It is designed to stop any motor instantly, to hold the load and to release with no drag. Brake is spring engaged and magnetically released. Unit was designed to mount on Nema type C motor flanges.

Multipurpose Hose

USE REPLY CARD—CIRCLE No. 27

Abrasoflex multipurpose hose, offered by Mercer Rubber Corp., New York, N. Y., is oil and abrasion resistant. It is available with a black cover with one or two braid, high tensile reinforcement in seven sizes ranging from $\frac{3}{16}$ to 1-inch ID.

Two-Piece Fastener

USE REPLY CARD—CIRCLE No. 28

Lock bolts, high strength, two-piece fasteners consisting of pin and a collar are available from Cherry Rivet Co., Los Angeles, Calif. Pin is inserted in the work from one side and the collar slipped onto the pin from the opposite side. A special pneumatic tool installs the fastener.

Selenium Rectifier Power Units

USE REPLY CARD—CIRCLE No. 29

Custom-made alternating to direct current rectifier power conversion units of high current and voltage capacities are announced by Syntron Co., Homer City, Pa. This development is possible by the manufacture of extra large selenium rectifier cells by the company's vacuum process.

Automatic Feed Plier

USE REPLY CARD—CIRCLE No. 30

Model P7 hog-ring type stapler made by Bostitch Inc., Westerly, R. I., has been improved by adding a heavy reinforcing plate to jaw of the magazine fed hog ringer. Wire, rods, cords and cables up to ½-inch in diameter can easily pass through the opened staple which can be closed as small as 5/16-inch.

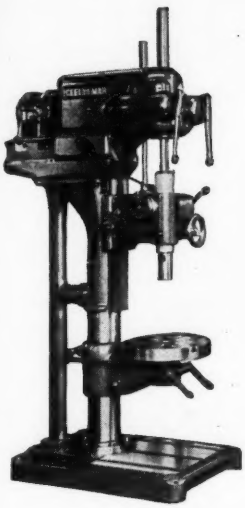
Self-Locking Anchor Nuts

USE REPLY CARD—CIRCLE No. 31

Self-locking anchor nuts, available from Kaynar Mfg. Co. Inc., Los Angeles, Calif., consist of a flanged anchoring portion integral with a

THE CLEEREMAN LINE

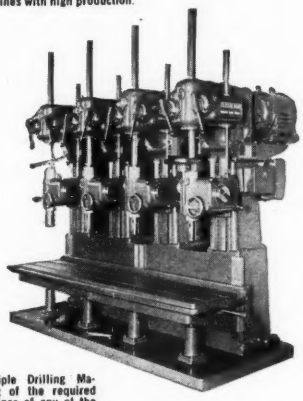
OF PRECISION JIG BORERS and DRILLING MACHINES



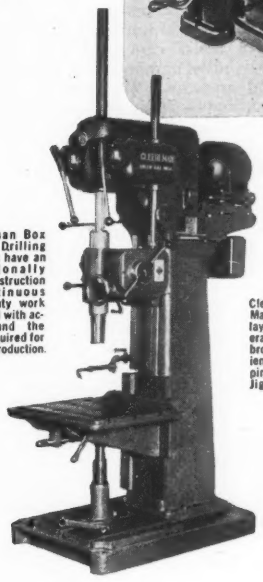
Cleereman Model 325 Single Unit Sliding Head Drilling Machines combine extreme sensitivity with rugged construction, are extremely versatile and may be used for production drilling and tapping.

Cleereman Jig Borers, noted for unexcelled precision, extreme accuracy, ease of operation in small lot production and in producing tools, dies, jigs or fixtures. Models available with electrically controlled prepositioning.

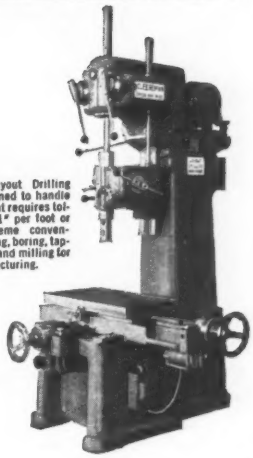
Cleereman Round Column Drilling Machines produce accurate holes at high speed and at low cost and are general purpose machines with high production.



Cleereman Multiple Drilling Machines consisting of the required number of machines of any of the three types supplied to meet individual requirements.



Cleereman Box Column Drilling Machines have an exceptionally rigid construction for continuous heavy duty work combined with accuracy and the speed required for low cost production.



Cleereman Layout Drilling Machine designed to handle layout work that requires tolerances of .001" per foot or broader. Extreme convenience for drilling, boring, tapping, reaming and milling for Jigless manufacturing.

BRYANT
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General Office
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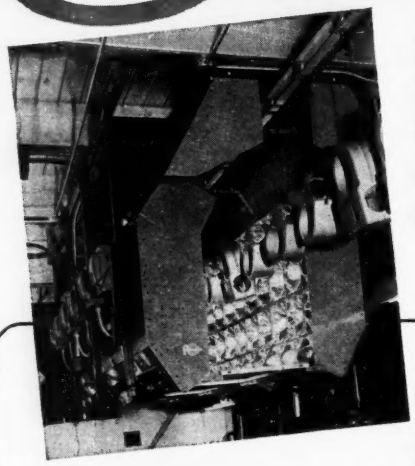
CLEEREMAN MACHINE TOOL CO. Green Bay, Wisconsin

BUILDERS OF PRECISION JIG BORERS AND DRILLING MACHINES

THOUSANDS OF PLANTS
Switch to
FOSTORIA INFRA-RED



Most efficient of all industrial ovens for finish baking and other heat applications

Typical of thousands of Fostoria installations replacing former heating or drying methods is the Infra-red oven at Automatic Burner Corp., of Chicago used for finish baking oil and gas burners. Here the light weight Fostoria oven is suspended from the ceiling, saving considerable floor space. The conveyorized system saves much handling. 350 units are now turned out in 8 hours compared with 150 units previously, and finishes are more durable and attractive. No heating up time is required — production is instantaneous with complete flexibility of control.

Throughout industry, new high standards of production efficiency are being set by utilization of the Fostoria Infra-red System. Savings in "per piece" production cost are substantial with many additional advantages on both large and small operations. Whatever your baking, drying, degreasing, or industrial heating problems may be, investigate the high efficiency of Infra-red ovens as engineered by Fostoria. Case histories of installations applicable to your production are available on request.

SAVES SPACE

Fostoria Infra-red ovens operate on a comparatively short cycle which results in smaller oven requirements. They may also be suspended from ceiling mounts to eliminate floor space entirely.

SAVES TIME

Reduces processing time from hours to minutes because of the inherent speed of Infra-red. There is no time lag in starting an oven, the heat is instantaneous.

SAVES MANPOWER—MANHOURS

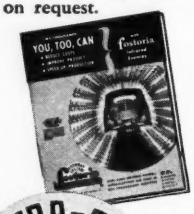
Ideal for conveyorized production methods. Reduces excessive product handling. Turns out more pieces per day with ease, with less people.

CUTS COSTS

Faster production, lower operating costs, improved quality, result in lowest "per piece" cost.

GET THE FACTS ON FOSTORIA "KNOW HOW" HELP TO REDUCE YOUR "PER PIECE" PRODUCTION COST

Write, today, for this factual information on this Infra-red process and equipment as engineered by Fostoria. Technical data applicable to your operations will be included if you send us general facts about your particular problem. A Fostoria representative will gladly analyze your production needs and submit definite recommendations and carefully forecasted results for your consideration.



THE FOSTORIA PRESSED STEEL CORPORATION
FOSTORIA, OHIO
Oldest and Largest Manufacturers of Industrial Infra-red Ovens

INFRA-RED fostoria SYSTEM

thin-walled draw shell which is fully tapped throughout its length. Made of high carbon annealed spring steel, it is crimped and then heat treated to provide a strong flexible threaded portion which resiliently grips the bolt within the span of the normally required number of threads without necessitating an auxiliary locking device.

Heavy Duty Primer

USE REPLY CARD—CIRCLE No. 32

Primer P-50, developed by Prufcoat Laboratories Inc., New York 17, N. Y., is composed of a heavy-bodied oil-modified synthetic resin vehicle, carrying a high percentage of inhibitive pigments, principally zinc chromate. It may be applied on severely corroded metal surfaces. Primer requires overnight drying prior to application of active-solvent finish coats.

Compression Pipe Coupling

USE REPLY CARD—CIRCLE No. 33

Compression pipe coupling that practically eliminates turbulence at the joint is available from Morris Coupling & Clamp Co., Ellwood City, Pa. It will couple ferrous to ferrous or ferrous to nonferrous materials and threaded to nonthreaded pipe. Coupling is made in sizes from ½ to 14 inches standard pipe sizes, including intermediate tube sizes.

Single Post Drill Jig

USE REPLY CARD—CIRCLE No. 34

A single post drill jig is offered by Esco Engineering Corp., Detroit 7, Mich. Called Mijit B-6, it is recommended for drilling small parts and for short and medium size runs. It provides an infinite number of locking positions due to its patented cam action. Locking is positive and requires no pressure.

Hermetically Sealed Switch

USE REPLY CARD—CIRCLE No. 35

Electro-Snap Division, Exhibit Supply Co., Chicago, Ill., announces a limit switch that is completely hermetically sealed. It features a tipping

USE A
REPLY CARD
Just circle the corresponding number of any item in this section for more information.

Helpful Literature

73. Carbide Tools

DoALL Co.—Straight turning, lead angle turning, pointed-nose, threading, end-cutting offset, side-cutting and square nose standard carbide tools are detailed in 8-page illustrated bulletin 52-817. Recommended procedures for rough and finish grinding of carbide tools are covered.

74. Production Lathes

R. K. LeBlond Machine Tool Co.—Specifications and design features of 20-in. rapid production lathes are covered in 4-page illustrated bulletin RP-220. Machines are engineered for almost unlimited variety of short cycle, long run operations. Standard bed length is 6¼ ft and distance between centers is 25¾ in.

75. Fastening Devices

Eaton Mfg. Co., Reliance Div.—40-page illustrated engineering book S-49 presents application and selection data on Springtite and Sem screw or bolt and washer assemblies. Fastener units are offered in round, fillister, pan, truss, hex and flat head types and in slotted, Phillips and Clutch head designs.

76. Totally-Enclosed Motors

U. S. Electrical Motors, Inc.—8-page illustrated brochure No. 1629 describes types SE and SES explosionproof and types SD and SS nonexplosionproof totally enclosed motors. The former feature impregnably insulated windings packed in asbestos separators. All have self-lubricated bearings into which fresh lubricant can be injected when desired.

77. Chucks

Supreme Products, Inc.—6-page pocket-size illustrated folder CC2051 is descriptive of precision-made Supreme brand chucks. Constructed of wear-resistant alloy steels, chucks feature one-piece construction of gear and nut which provides positive gripping action.

78. Protective Packaging

Reynolds Metals Co.—Actual samples as well as complete specifications of four weights of aluminum foil ranging from 0.001 to 0.003-gage are contained in 8-page bulletin and supplementary technical data folders "Protective Packaging with Plain Aluminum Foil." Use of material in compliance with government specifications as barrier and preservation materials is covered.

79. Drum Cleaning

Pangborn Corp.—6-page illustrated folder No. 220 is descriptive of two Rotoblast drum cleaning machines, one having capacity of 70 drums per hour, the other 140 drums per hour. Loading of machines, safeguards and engineering specifications are covered.

80. Adjustable Snap Gages

Niles-Bement-Pond Co., Pratt & Whitney Div.—Advantages and features of four models in line of American Gage Design adjustable limit snap gages are given in 4-page illustrated circular No. 460-3.

81. New Aircraft Steels

Joseph T. Ryerson & Son, Inc.—Anyone concerned with the specification or purchase of steel that must meet aeronautical specifications will find 68-page booklet, "Ryerson Aircraft Steels," of value. It lists sizes and analyses carried in stock and includes revised Military Specifications to August 1, 1951.

82. Welding Products

Taylor-Wharton Iron & Steel Co.—Physical properties, application methods and other technical data pertinent to Tisco Timang manganese-nickel steel welding products and cast manganese steel point bars, grouser bars and repointers are found in 6-page illustrated bulletin 451. Rods produce weld with general characteristics of 12 per cent manganese steel.

83. Barrel-Finishing

Norton Co.—"Barrel-Finishing with Alundum Tumbling Abrasive" is title of 56-page pocket size manual which covers in section I, features of Alundum abrasive, equipment, cleaners and rust preventives; in section II, roughing, finishing, separation of work from abrasive, washing, drying and rescreening the abrasive; and in section III, practical hints to operators.

84. Oil-Gas Generator

Vapofier Corp.—4-page illustrated bulletin 102-A is entitled "Make Your Own Gas with VapOfier." Usable for industrial heat applications, this equipment generates oil-gas and is available in capacities ranging from 70,000 to 2,000,000 Btu per hr.

85. Alloy Steels

Wheelock, Lovejoy & Co.—32-page pamphlet entitled "Alloy Steels" is application guide covering the quality, heat treatment, physical properties and common uses of Hy-Ten AISI and SAE alloy steels. Most of data are tabulated for quick reference.

FOR MORE INFORMATION USE ONE OF THESE CARDS . .

FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) Cleveland, Ohio

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HELPFUL LITERATURE

86. Heat Treating Baskets

Rolock Inc.—Descriptions and photographs of 75 custom-built fabricated alloy heat treating baskets, crates, racks, retorts, trays, muffles and fixtures are included in catalog No. B-8. Serpentine grid which retains its shape at high temperatures can be used as brazing tray, or with superstructure, as furnace basket for annealing, pickling and quenching.

87. Enamel Finishes

Chamberlain Engineering Co.—High bond strength, fast drying time, good chemical resistance and wide color range are some of the features of Neolac 600 enamel outlined in 4-page illustrated bulletin 239. Supplementary application sheet includes color chips.

88. Thickness Controls

Traceriab Inc.—12-page brochure explains applications and operation of two new absorption and backscatter beta gages which are used for the determination of weight per unit of area of sheet materials such as paper, plastics, rubber, light metals and other continuous process materials. Gaging can be performed while material is being processed.

89. Rust Prevention

Angier Corp.—4-page illustrated folder brings reader up to date on latest vapor method of rust prevention that makes slushing with grease or oil unnecessary.

90. Benders, Shears & Parters

O'Neil-Irwin Mfg. Co.—4-page illustrated form No. 16 presents specifications, capacities and other pertinent information on Di-Acro power benders, shears and parters. All are offered in various sizes and capacities.

91. Power Roof Ventilators

Swartwout Co.—Specifications and capacities of Whirlout straight-through power roof ventilators are tabulated in 2-page illustrated bulletin 346. Ventilators are offered in 16 to 60-in. sizes with capacities up to 70,300 cfm.

92. Rotary Straighteners

Mackintosh-Hemphill Co. — 4-page illustrated bulletin S-7265 describes rotary straighteners for all pipe and tube applications. Eleven models have specific range of tube diameters, but provide wide overlap in capacity. Size range is from ⅛ to 5 in.

93. Hard Facing Alloy

Victor Equipment Co. — Entitled "Victoralloy," 4-page illustrated booklet describes fabricated hard facing rod which imparts abrasion and impact resistance to all types of industrial equipment and components. Alloy can be applied with conventional welding equipment.

94. Pyrometer Supplies

Arklay S. Richards Co.—16-page illustrated catalog No. 5 contains descriptions, specifications and ordering information on thermocouples, protection tubes, thermocouple and lead wires and insulators for all pyrometer makes.

95. Electrical Insulation

Richardson Co.—Grade T-812 laminated Insurok for high frequency electronic applications is thoroughly covered in technical data sheet 20.812.1. Electrical and physical characteristics, as well as properties, available forms and fabricating methods are listed.

96. Metal Testing Device

Sperry Product, Inc.—Described and illustrated in 4-page bulletin 50-105 is the type UR Reflectoscope, a nondestructive testing instrument for locating internal defects in metals and other materials. Device employs ultrasonic vibrations and will penetrate up to 30 ft of material.

97. Masonry Seal

Monroe Co.—Presented in layman's language, 10-page technical data and application bulletin No. 126-11 describes Monoseal, a silicone base material for making masonry walls water repellent. Material is transparent, colorless and effects water repellency in one application.

98. Air Control Panel

C. A. Norgren Co.—2-page illustrated Norgren Blueprints No. 110 is data sheet showing air control panel adopted as standard equipment for large presses by an automobile manufacturer. Profitable results are related.

99. Stellite-Welded Solenoids

National Acme Co.—Applications, details of design, materials and construction and specifications for various Stellite-welded solenoid types are offered in 20-page illustrated bulletin No. EM-46A. Data on typical mountings and dimensional drawings are included.

100. Production Planning

Visual Planning Equipment Co.—80-page illustrated catalog presents "whys" of three-dimensional planning and outlines Repro-Templet system of reproducing scale plans. Over 6000 scale models for production planning are itemized. Three include machine tools, materials handling equipment, shop equipment and office equipment.

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diaphragm action (no sliding parts) to prevent jamming from ice formation. There is no condensation within the enclosed mechanism from humidity and temperature cycling.

Phosphate-Chromate Primer

USE REPLY CARD—CIRCLE No. 36

Ospho, a balanced formula of orthophosphoric and dichromate with extenders and wetting agents, is used to prime rusted surfaces. Made by Rusticide Products Co., Cleveland 14, O., it is applied to the surface after loose rust and scale have been removed with a wire brush. It causes iron oxide to chemically change to iron phosphate, rust action is stopped and subsequent paint attaches itself so tightly that moisture and oxygen cannot attack the metal. Primer may also be used to prime new ferrous metal.

Electrode Holder

USE REPLY CARD—CIRCLE No. 37

Caddy type A electrode holder, offered by Erico Products Inc., Cleveland 3, O., features a welding cable connected by the Cadweld process and is available in 300 and 500 amp capacity. The spring assembly is engineered to give a uniform pressure when inserting or ejecting electrodes. After cable is worn and ready to be changed, old cable with stud attached may be cut off and cable Cadwelded to new stud.

Cushion Clutch Air Screwdrivers

USE REPLY CARD—CIRCLE No. 38

Ingersoll-Rand Co., New York 4, N. Y., announces a line of cushion clutch air screwdrivers in three basic sizes for general manufacturing operations. The engaging clutch enables screwdriver to be moved from screw to screw without stopping the motor as slight forward pressure on the tool is necessary to rotate the bit. Ball-type torque limiting clutch permits adjustment for precise torque control and enables operator to drive all screws to same degree of tightness.

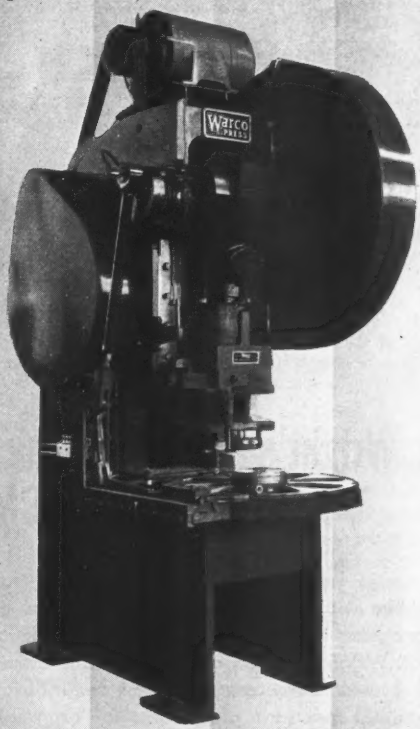
Follow-Through Type Hole Saws

USE REPLY CARD—CIRCLE No. 39

Designated as Blu-Mol, a line of high speed, heavy duty, follow-through type hole saws in sizes up to 4½ inches in diameter is introduced by Millers Falls Co., Greenfield, Mass. Holes to a depth of 1⅛-inch may be cut in solid stock. As the body of the saw is slightly smaller than the cutting diameter, the tool follows through the hole it cuts.

Warco®

Production minded dial feed press completes automotive filter assembly every two seconds . . .



This Warco 75-ton, single crank, straight side Gap Press simultaneously performs two separate operations on the assembly of an oil filter for automobile crankcases — as fast as an operator can load the eight-station dial feed — and with maximum safety to operator as loading station is in the clear of press slide.

The screen that makes up the filter and the frame for the filter, in a 90° flanged condition, is placed into spring loaded dogs in the dial openings. These progress to the first die on the slide which makes a 45° closing on the flanges . . . then to the second die which closes and coins the flanges, producing a completely assembled unit at each stroke of the press. The completed piece then progresses to the next station where it is automatically ejected by a spring loaded pusher arm.

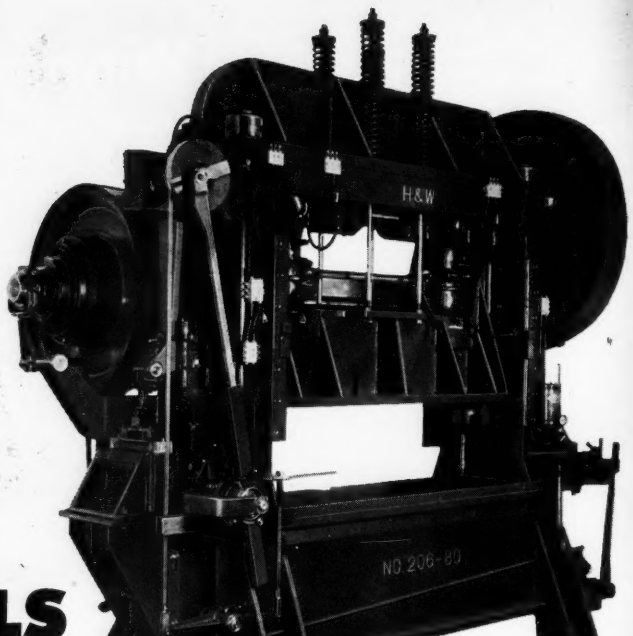
If you have special requirements on your press operations let Warco engineers know about it . . . contact the Warco representative nearest you or write direct . . . it will pay dividends.

Federal® WELDERS

THE FEDERAL MACHINE & WELDER COMPANY

WARREN, OHIO

Warco PRESSES®



BLACKSMITH for ARSENALS

Henry & Wright's Double Crank Press . . . stronger with ACME welded fabrication

Time was when the implements of war had to be shaped by the heat of a forge and the strong arm of a blacksmith on an anvil. Today for the mobilization program this double crank press, precision-engineered by the Henry & Wright division of Emhart Manufacturing Company, cuts and forms strip steel into carbine magazines by the thousands . . . the work of a modern blacksmith speeding production for national defense.

For greater strength and rigidity the frame members, slide, and large gear of this press were all-welded by Acme Tank & Welding. The rugged box construction in the bed, essential to withstand the incessant 150-ton pounding, was made possible by welding.

More and more machinery manufacturers, like Henry & Wright, are relying on Acme for the advantages of welded fabrication because Acme's engineering skill and complete facilities guarantee exact adherence to their specifications, no matter what the size or design of their weldment. Let us show you how an Acme weldment can improve your product.

ACME
TANK and WELDING
DIVISION of THE UNITED TOOL & DIE CO.
WEST HARTFORD 10, CONNECTICUT

Write Acme today: send your blue prints or a rough sketch . . . you'll receive a prompt quotation.

- A.S.M.E. Qualified Welders • National Board Approved
- Hartford Steam Boiler Inspection Service • A.P.I. Approved
- Rating Approved by Natl. Assoc. of H.P. & A.C. Contractors
- Underwriters Label and Inspection Service • Navy Approved

The Market Outlook

OVERALL pressure for steel continues unabated. But soft spots are developing in demand, chiefly from consumer durable goods lines, which give the market a spotty appearance. This is reflected in several ways: 1—Conversion deals, especially in sheets, are on the decline; 2—shipments on defense account are improving; 3—premium prices on gray market and imported steel are being shaved; 4—increasingly larger steel tonnage is being diverted to production of those products required chiefly for defense programs. Meanwhile, military and related defense requirements are rising steadily and promise to continue to expand.

SUPPLY— Despite growing evidence of slackening demand from consumer durable goods manufacturers, some interests in this consuming area report difficulty in filling their needs. This is true even in sheets which are definitely under less pressure. Explanation for this seeming paradox is found in the fact the slack in sheets is being offset to large extent by increasing diversion of semifinished steel to production of those products in more acute shortage, notably plates which can be rolled on continuous mills. In especially tight supply at present are plates, bars and structural shapes, in that order.

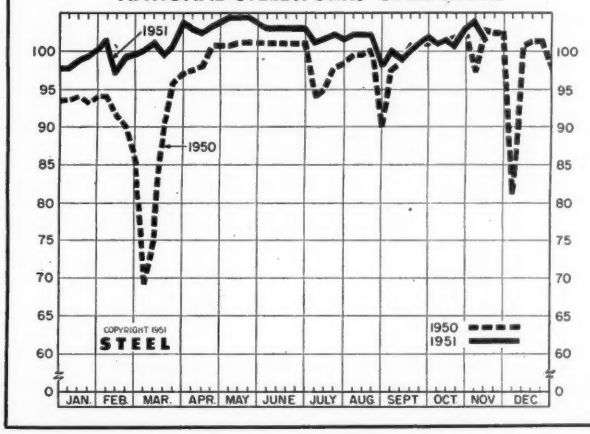
REQUIREMENTS— Whether the slackening in demand being experienced in some areas of the market accurately reflect basic economic conditions is debatable. There is evidence to indicate some of the contraction being experienced in certain lines is directly attributable to government restrictions on production. Certainly there still is a large unsatisfied demand for steel as evidenced by the fact producers experienced a flurry of orders in virtually all major products just before Nov. 2, the date on which they were to open their books on a first-come first-served basis for January under government regulations. Elimination by NPA of the 10 per cent product set-aside under this regulation failed to check the flow of requests for January tonnage. Modification of the order came too close to the effective date. It did, however, limit mill acceptances of additional orders, and to that extent contributed a stabilizing influence in the market.

PRODUCTS— Plate producers were under pressure for additional tonnage on the first-come first-served basis just before Nov. 2. But they had little tonnage open for the month. In fact, they will have little tonnage available outside their commitments for months to come barring order cancellations. In structurals, however, the situation presents a different outlook. While supply of shapes is short, fabricators are showing noticeably less concern in their inventory position with their order backlogs shrinking due to government restrictions on building. Early this year they held well over 12 to 15 months work on order. Now they can accept rated tonnage for delivery in five to six months. The bar mills are accepting only high-rated business for second quarter. Bar sizes beyond three inches are in extremely short supply. Sheetmakers, despite the slackening in consumer goods, were deluged with orders for January on a first-come first-served basis. Pig iron now is in closer balance with requirements than it has been in many months. So is coke. This reflects slower demand for castings arising from the contraction in civilian goods production.

PRICES— With the exception of a general upward adjustment in galvanized products, reflecting the recent increase in zinc, a downward revision in an eastern seller's quotations on structural shapes and plates, and an upward revision by OPS on southern brown iron ore, the steel and related markets continue to hold at the long-established ceiling levels. STEEL's weighted index on finished steel is unchanged at 171.92 as is the arithmetical composite on finished steel at $106.32.

PRODUCTION— Steelmaking operations declined last week, due primarily to sharp curtailment of production in the Birmingham district as result of labor trouble. Estimated national ingot rate dropped 2.5 points to 101.5 per cent of capacity.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Nov. 10	Change	Same Week 1950	Same Week 1949
Pittsburgh	102	— 1*	104.5	2
Chicago	106	— 3*	106	6
Mid-Atlantic	101	0	100	65
Youngstown	106	0	104	5
Wheeling	100	— 1.5	98.5	60
Cleveland	104	+ 0.5*	98	14
Buffalo	104	0	104	85
Birmingham	17	—43	100	6
New England	90	0	90	58
Cincinnati	106	+ 3	106	52
St. Louis	90	— 1	91.5	91.5
Detroit	104	+ 2.5	106	41
Western	102	— 3	103	29.5
Estimated national rate	101.5	— 2.5	103	24

Based on weekly steelmaking capacity of 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 39 *Production-Engineering News—p. 75*

Composite Market Averages

FINISHED STEEL INDEX, Weighted:

	Nov. 8 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100) ..	171.92	171.92	171.92	157.76	112.04
Index in cents per lb.	4.657	4.657	4.657	4.274	3.035

ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT	$106.32	$106.32	$106.32	$95.09	$64.45
No. 2 Fdry, Pig Iron, GT..	52.54	52.54	52.54	49.54	28.17
Basic Pig Iron, GT	52.16	52.16	52.16	49.04	27.50
Malleable Pig Iron, GT ...	53.27	53.27	53.27	50.27	28.79
Steelmaking scrap, GT ...	43.00	43.00	44.00	41.67	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Nov. 8 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.45	2.50
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.50
Bars, H.R., del. Philadelphia	4.223	4.223	4.223	3.93	2.86
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.15	3.10
Shapes, Std., Pittsburgh....	3.65	3.65	3.65	3.40	2.35
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.35
Shapes, del. Philadelphia...	3.918	3.918	3.918	3.46	2.48
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.50
Plates, Chicago	3.70	3.70	3.70	3.50	2.50
Plates, Coatesville, Pa. ...	4.15	4.15	4.15	3.90	2.50
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.50
Plates, Claymont, Del.	4.15	4.15	4.15	3.90	2.50
Sheets, H.R., Pittsburgh...	3.60–75	3.60–75	3.60–75	3.35	2.425
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.425
Sheets, C.R., Pittsburgh...	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.375
Sheets, Galv., Pittsburgh..	4.80	4.80	4.80	4.40	4.05
Strip, H.R., Pittsburgh	3.75-4.00	3.75-4.00	3.75-4.00	3.50-3.75	2.35
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.35
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.15-4.85	3.05
Strip, C.R., Chicago	4.90	4.90	4.90	4.30	3.15
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-5.10	3.15
Wire, Basic, Pittsburgh ...	4.85-5.10	4.85-5.10	4.85-5.10	4.50-4.75	3.05
Nails, Wire, Pittsburgh ...	5.90-6.20	5.90-6.20	5.90-6.20	5.30-5.60	3.75
Tin plate, box, Pittsburgh.	$8.70	$8.70	$8.70	$7.50	$5.25

SEMIFINISHED

Billets, forging, Pitts.(NT)	$66.00	$66.00	$66.00	$63.00	$47.00
Wire rods, ¼-⅝", Pitts....	4.10–30	4.10–30	4.10–30	3.85	2.30

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$50.00	$29.00
Basic Valley	52.00	52.00	52.00	49.00	28.00
Basic, del. Phila.	56.61	56.61	56.61	53.39	29.93
No. 2 Fdry, Pitts.	52.50	52.50	52.50	49.50	28.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	49.50	28.50
No. 2 Fdry, Valley	52.50	52.50	52.50	49.50	28.50
No. 2 Fdry, Del. Phila....	57.11	57.11	57.11	53.89	30.43
No. 2 Fdry, Birm.	48.88	48.88	48.88	45.88	24.88
No. 2 Fdry (Birm.) del, Cin.	55.49	55.49	55.49	52.58	28.94
Malleable Valley	52.50	52.50	52.50	49.50	28.50
Malleable, Chicago	52.50	52.50	52.50	49.50	28.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	62.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt. Pitts...	$44.00	$44.00	$45.00	$44.00	$20.00
No. 1 Heavy Melt. E. Pa..	42.50	42.50	43.50	41.00	18.75
No. 1Heavy Melt. Chicago.	42.50	42.50	43.50	40.00	18.75
No. 1 Heavy Melt. Valley..	44.00	44.00	45.00	43.75	20.00
No .1 Heavy Melt. Cleve...	43.00	43.00	44.00	43.25	19.50
No. 1 Heavy Melt. Buffalo	43.00	43.00	44.00	41.50	19.25
Rails, Rerolling, Chicago ..	52.50	52.50	52.50	64.50	22.25
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	53.50	20.00

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn. Connisvl. ..	$14.75	$14.75	$14.75	$14.25	$8.75
Beehive, Fdry., Connisvl...	17.50	17.50	17.50	16.50	9.50
Oven Fdry., Chicago	23.00	23.00	23.00	21.00	14.35

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	14.375
Zinc, E. St. Louis	19.50	19.50	19.50	17.50	9.25
Lead, St. Louis	18.80	18.80	18.80	16.80	8.10
Tin, New York 103.00	103.00	103.00	140.00	52.00	
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex. ..	42.00	42.00	42.00	32.00	14.50
Nickel, refinery, duty paid.	56.50	56.50	56.50	48.00	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N. Y., del.	....	59.18	59.68	....
Newark,del.	56.37	57.37	57.87	58.37
Philadelphia, del.	56.61	57.11	57.61	58.11
Birmingham District				
AlabamaCity,Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward,Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda,N.Y. W12	52.00	52.50	53.00	....
No.Tonawanda,N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester,N.Y., del.	54.88†	55.38†	55.88†	....
Syracuse,N.Y., del.	55.91†	56.41†	56.91†	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary,Ind. U5	52.00	....	52.50	....
IndianaHarbor,Ind. I-2	52.00	....	52.50	....
So.Chicago,Ill. W14	52.00	52.50	52.50	....
So.Chicago,Ill. Y1	52.00	52.50	52.50	....
So.Chicago,Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon,Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron,O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain,O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie,Pa. I-3	52.00	52.50	52.50	53.00
Everett,Mass. E1	....	57.00	57.50	....
Fontana,Calif. K1	58.00	58.50	....	....
Geneva,Utah G1	52.00	52.50	....	....
Seattle,Tacoma,Wash., del.	....	60.66	....	....
Portland,Oreg., del.	....	60.66	....	....
LosAngeles,SanFrancisco, del. ...	60.16	60.66	....	....
GraniteCity,Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
LoneStar,Tex. L6	48.00	*48.50	48.50	....
Minnequa,Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
NevilleIsland,Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKees Rocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer,Pa. U5	52.00	....	52.50	53.00
Clairton,Rankin,So.Duquesne,Pa. U5	52.00	....	....	....
McKeesport,Pa. N3	52.00	....	....	53.00
Monessen,Pa. P7	54.00	....	....	....
Sharpsville,Pa. S6	....	....	52.50	53.00
Steelton,Pa. B2	54.00	54.50	55.00	55.50
Swedeland,Pa. A3	56.00	56.50	57.00	57.50
Toledo,O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy,N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard,O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield,O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade. † Preliminary.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson,O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

NiagaraFalls,N.Y. P15	$88.00
Keokuk,Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee,Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$66.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton,Pa. B2	60.00
Philadelphia delivered	63.37
Troy,N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Nov. 8, 1951; cents per pound except as otherwise noted. Changes shown in Italics.
Code numbers following mill points indicate producing company; key on next two pages

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$79.00
Munhall,Pa. U5 .....52.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston,Tex. S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairfield,Ala. T2 .....56.00
Fontana,Calif. K1 ....75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y., B2..56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 ....56.00
So.Duquesne,Pa. U5 ...56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3 ..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 .....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. U5 .....66.00
Geneva,Utah G1 .....66.00
Houston,Tex. S5 .....74.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2 ..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2,U5,W14 ..66.00
So.Duquesne,Pa. U5 ...66.00
So.SanFrancisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O. (29) T7 .....66.00
Conshohocken,Pa. A3 ..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston,Tex. S5 .....78.00
Ind.Harbor,Ind. Y1 ....70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2 ..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14..70.00
So.Duquesne,Pa. U5 ...70.00
Struthers,O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ...103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago, Ill. R2 ...82.00
So.Duquesne,Pa. U5 ...82.00

SHEET BARS (NT)
Fontana,Calif. K1 ...$89.00

SKELP
Aliquippa,Pa. J5 .....$3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown, R2, U5 ..3.35

WIRE RODS
Alton, Ill. 4.40
AlabamaCity,Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.90
Houston,Tex. S5 .....4.50
Johnstown,Pa. B2 ....4.10
Joliet,Ill. A7 .....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ...4.35
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y.B11 ..4.10
Pittsburg,Calif. C11 ....4.75
Portsmouth,O. P12 ....4.30
Roebling,N.J. R5 .....4.20
So.Chicago,Ill. R2 ....4.10
SparrowsPoint,Md. B2 ..4.20
Sterling,Ill.(1) N15 ....4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ....4.90
Worcester,Mass. A7 ....4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2 ....4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 .....4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 .....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah G1 .....3.65
Houston,Tex. S5 .....4.05
Ind.Harbor,Ind. I-2 ....3.65
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.25
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 .....3.65
Niles,Calif. (22) P1 ....4.85
Phoenixville,Pa. P4 .....5.90
Portland,Oreg. O4 .....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5,W14..3.65
So.SanFrancisco B3 ....4.20
Torrance,Calif. C11 ....4.25
Weirton,W.Va. W6 ....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 .....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 .....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2 ..5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 .....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah G1 .....5.50
Ind.Harbor,Ind. I-2 ....5.50
Ind.Harbor,Ind. Y1 .....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 .....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fontana,Calif. K1 .....4.65
Lackawanna,N.Y. B2 ...3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.50
Lackawanna,N.Y. B2 ..5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 .....5.45

BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala. T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ...5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1 ..6.25
Gary,Ind. U5 .....5.65
Geneva,Utah G1 .....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y1 .....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.65
SparrowsPoint,Md. B2 ..5.65
Warren,O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ....4.85
Coatesville,Pa. L7 .....5.25
Conshohocken,Pa. A3 ...5.05
Fontana,Calif. K1 .....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 .....4.75
SparrowsPoint,Md. B2 ..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ...4.75
Ind.Harbor,Ind. I-2 ....4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 .....4.75

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ...3.95
Ashland,lcl(15) A10 ....4.45
Cleveland,c.l. R2 .....4.30
Warren,O.c.l. R2 .....4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky.(15) A10 ..3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. C22 .....4.15
Cleveland J5, R2 .....3.70
Coatesville,Pa. L7 .....4.15
Conshohocken,Pa. A3...4.15
Fairfield,Ala. T2 .....3.70
Fontana,Calif.(30) K1 ..4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 .....4.40
Geneva,Utah, G1 .....3.70
Harrisburg,Pa. C5 .....6.30
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5, W14.3.70
SparrowsPoint,Md. B2 ..3.70
Steubenville,O. W10 ....3.70
Warren,O. R2 .....3.70
Weirton,W.Va. W6 ....4.00
Youngstown R2, U5, Y1.3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.45
Geneva,Utah G1 .....4.85

PLATES, Wrought Iron
Economy,Pa. B14 .....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill. L1 .....4.15
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11.3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.Chicago R2,U5,W14 .3.70
So.Duquesne,Pa. U5 ....3.70
So.SanFran.,Cal. B3 ....4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 ....3.85
Youngstown R2, U5 ....3.70

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 370
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Niles, Calif. P1 .....5.05
Portland,Oreg. O4 .....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES; H.R. CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.30
Houston,Tex. S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2,U5,W14..4.30
So.Duquesne,Pa. U5 ....4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary, Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer, Ala. T2 .....5.55
Betnlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. Y1 ..6.05
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ..5.55
Los Angeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 ....5.55
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....4.55
BeaverFalls,Pa. M12,R2.4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 .....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.55
Elyria,O. W8 .....4.55
FranklinPark,Ill. N5 ...4.55
Gary,Ind. R2 .....4.55
GreenBay, Wis. F7 .....4.55
Hammond,Ind. L2, M13.4.55
Hartford,Conn. R2 .....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 ....5.10
Massillon,O. R2, R8 ....4.55
Monaca, Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 ....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 ....5.10
Readville,Mass. C14 ....5.10
St.Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa. (5) K3 ..5.05
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 ....4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12 ...5.40
Bethlehem,Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O.(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn. R2 ....5.85
Harvey,Ill. B5 .....5.40
Lackawanna,N.Y. B2 ...5.40
Mansfield,Mass. B5 ....5.85
Massillon,O. R2, R8 ...5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 ....5.60
So.Chicago,Ill. R2, W14.5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ....5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ...4.75
ChicagoHts.(3,4) I-2 ...4.75
Franklin,Pa. (3,4) F5 ..4.75
FortWorth,Tex(26) T4..4.85
Huntngtn,W.Va.(3) W7.5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda (3,4) B12 ..4.75
Williamsport(3) S19 ....5.00
Williamsport(4) S19 ....5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover,(Eng.Bolt) U1 ..13.50
Dover,(Wrgt.Iron) U1 12.25
Economy,Pa. (S.R.) B14.9.60
Economy,Pa.(D.R.)B14 11.90
Economy,(Staybolt)B14 12.20
McK.Rks.(Staybolt) L5.14.50
McK.Rks.(S.R.) L5 ....9.60
McK.Rks.(D.R.) L5 ...13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..3.70
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
Pittsburgh J5 .....3.70
Seattle B3, N14 .....4.45
So.Chicago R2,U5,W14 .3.70
So.SanFrancisco B3 ....4.30
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 ....3.60
WestLeechburg,Pa. A4..3.75
Youngstown U5, Y1 ....3.60

SHEETS, H.R., (19 gage)
AlabamaCity,Ala. R2 ..4.75
Dover,O. R1 .....5.65
Ind.Harbor,Ind. I-2, ...5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 ....5.40

SHEETS, H.R., (14-ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ..5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 ....5.40
IndianaHarbor,Ind. Y1 5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 ...5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 .....5.40
SparrowsPoint (36) B2 5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 ....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....6.55
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1..7.05
IndianaHarbor,Ind. I-2 6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 ...6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2 .6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 ....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10
Torrance,Calif. C11	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23)F4	6.85

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Cal. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

SHEETS, Culvert No. 16	Cu	Cu Alloy	Cu Fe
Ashland,Ky. A10.	5.60		...
Canton,O. R2	5.65	6.10	
Fairfield,Ala. T2.	5.60	5.85	
Gary U5	5.60	5.85	
IndianaHarbor I-2	5.60	5.85	
Irvin,Pa. U5	5.60	5.85	
Kokomo,Ind. C16.	6.25		...
MartinsFy,O. W10	5.60	5.85	
Pittsburg,Cal. C11	6.35		...
SparrowsPt. B2.	5.60		...
Torrance,Cal. C11	6.35		...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$8.45	$8.70
Fairfield,Ala. T2.	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har. I-2, Y1.	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va. W6	8.45	8.70
Yorkville,O. W10.	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2.	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1.	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3.	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1.	3.50
Johnstown,Pa.(25) B2.	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32)B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.00
Minnequa,Colo. C10	4.55
New Britain(10) S15	4.00
No.Tonawanda,N.Y. B11.	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4.	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgprt,Conn.(10)	S15 5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Beres,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	....
Detroit D2	5.60	6.65	7.25	...	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	....	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	....
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8: Cleve.orPitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Mass.,Base.	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	....	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65
Spring Steel (Tempered)					
Trenton,N.J. R5	....	...	10.30	12.50	15.35
Harrison,N.J. C18	....	...	10.30	12.50	15.35
NewYork W3	....	...	10.30	12.50	15.35

STRIP, Hot-Rolled Carbon

Midland,Pa. C18	5.85
NewBritn,Conn.(10)	S15 5.45
Sharon,Pa. S3	5.85
Youngstown U5	5.50

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10)	S15 5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40)T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

TIN PLATE, Electrolytic (Base Box)

	0.25-lb	0.50 lb	0.75lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½¢ lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut-lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	....	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths).	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½¢ lower) Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

Key To Producers

A1 Acme Steel Co.	
A3 Alan Wood Steel Co.	
A4 Allegheny Ludlum Steel	
A7 American Steel & Wire	
A8 Anchor Drawn Steel Co.	
A9 Angell Nail & Chaplet	
A10 Armco Steel Corp.	
A11 Atlantic Steel Co.	
A13 American Cladmetals Co.	
B1 Babcock & Wilcox Tube	
B2 Bethlehem Steel Co.	
B3 Beth. Pac. Coast Steel	
B4 Blair Strip Steel Co.	
B5 Bliss & Laughlin Inc.	
B6 Boiardi Steel Corp.	
B8 Braeburn Alloy Steel	
B11 Buffalo Bolt Co.	
B12 Buffalo Steel Co.	
B14 A. M. Byers Co.	
C1 Calstrip Steel Corp.	
C2 Calumet Steel Div. Borg-Warner Corp.	
C4 Carpenter Steel Co.	
C5 Central Iron & Steel Div. Barium Steel Corp.	
C7 Cleve. Cold Rolling Mills	
C8 Cold Metal Products Co.	
C9 Colonial Steel Co.	
C10 Colorado Fuel & Iron	
C11 Columbia Steel Co.	
C12 Columbia Steel & Shaft	
C13 Columbia Tool Steel Co.	
C14 Compressed Steel Shaft	
C16 Continental Steel Corp.	
C17 Copperweld Steel Co.	
C18 Crucible Steel Co.	
C19 Cumberland Steel Co.	
C20 Cuyahoga Steel & Wire	
C22 Claymont Steel Corp.	
D2 Detroit Steel Corp.	
D3 Detroit Tube & Steel	
D4 Disston & Sons, Henry	
D6 Driver Harris Co.	
D7 Dickson Weatherproof Nail Co.	
E1 Eastern Gas&Fuel Assoc.	
E2 Eastern Stainless Steel	
E4 Electro Metallurgical Co.	
E5 Elliott Bros. Steel Co.	
E6 Empire Steel Corp.	
F2 Firth Sterling Steel	
F3 Fitzsimons Steel Co.	
F4 Follansbee Steel Corp.	
F5 Franklin Steel Div. Borg-Warner Corp.	
F6 Fretz-Moon Tube Co.	
F7 Ft. Howard Steel & Wire	
G1 Geneva Steel Co.	
G2 Globe Iron Co.	
G3 Globe Steel Tubes Co.	
G4 Granite City Steel Co.	
G5 Great Lakes Steel Corp.	
G6 Greer Steel Co.	
H1 Hanna Furnace Corp.	
I-1 Igoe Bros. Inc.	
I-2 Inland Steel Co.	
I-3 Interlake Iron Corp.	
I-4 Ingersoll Steel Div., Borg-Warner Corp.	
J1 Jackson Iron & Steel Co.	
J3 Jessop Steel Co.	
J4 Johnson Steel & Wire Co.	
J5 Jones & Laughlin Steel	
J6 Joslyn Mfg. & Supply	
J7 Judson Steel Corp.	
J8 Jersey Shore Steel Co.	
K1 Kaiser Steel Corp.	
K2 Keokuk Electro Metals	
K3 Keystone Drawn Steel	
K4 Keystone Steel & Wire	
L1 Laclede Steel Co.	
L2 LaSalle Steel Co.	
L3 Latrobe Electric Steel	
L5 Lockhart Iron & Steel	
L6 Lone Star Steel Co.	
L7 Lukens Steel Co.	

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn. (10)	$15 10.75
Carnegie,Pa.	S18 ....10.60
Cleveland	A7 .....10.00
Dover,O.	G6 .....10.50
Fontana,Calif.	K1 ....11.65
Harrison,N.J.	C18 ....10.60
Midland,Pa.	C18 ....10.60
NewBritn,Conn. (10)	$15 10.75
Pawtucket,R.I. (11)	N8.10.75
Pawtucket,R.I. (12)	N8.11.05
Sharon,Pa.	S3 .....10.60
Worcester,Mass.	A7 ..10.30
Youngstown	C8 .....10.60

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky. (8)	A10 ..3.75
Warren,O.	R2 .....4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O.	R2 .....5.25

TIGHT COOPERAGE HOOP

Atlanta	A11 .....4.05
Riverdale,Ill.	A1 .....3.90
Sharon,Pa.	S3 .....4.15
Youngstown	U5 .....3.75

WIRE, Merchant Quality

(6 to 8 gage)		An'ld	Galv.
AlabamaCity	R2.	5.70	5.95
Aliquippa	J5 ...	5.70	6.15
Atlanta	A11	5.95	6.40
Bartonville(19)	K4	5.70	6.15
Buffalo	W12 ...	4.85	...
Cleveland	A7	5.70	6.15
Crawfordsville	M8	5.95	6.40
Donora,Pa.	A7 ..	5.70	6.15
Duluth,Minn.	A7.	5.70	6.15
Fairfield	T2 ...	5.70	6.15
Houston,Tex.	S5 .	6.10	6.55
Johnstown	B2 ..	5.70	6.15
Joliet,Ill.	A7 ...	5.70	6.15
KansasCy,Mo.	S5.	6.30	6.75
Kokomo	C16 ...	5.80	6.05
LosAngeles	B3 ..	6.65	...
Minnequa	C10 ...	5.95	6.45
Monessen	P7	5.95	6.40
Palmer	W12	5.15	...
Pitts.,Calif.	C11.	6.65	6.80
Prtsmth.(18)	P12 .	6.10	6.60
Rankin	A7	5.70	6.15
So.Chicago	R2 ..	5.70	5.95
So.S.Fran.	C10 ..	6.65	7.10
SparrowsPt.	B2..	5.80	6.25
Sterling,Ill. (1)	N15	5.70	6.15
Struthers,O.	Y1 .	5.70	6.15
Torrance,Cal.	C11	6.65	...
Worcester	A7 ...	6.00	6.45

ROPE WIRE

	(A)	(B)
Alton,Ill. L1	... 8.65	8.90
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	.... 8.55	8.80
Fostoria,O. S1	.. 8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7.	8.80	9.05
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5.	8.85	9.10
SparrowsPt, B2..	8.65	8.90
Struthers,O. Y1..	8.55	8.80
Worcester J4, T6.	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala.	R2...4.85
Aliquippa,Pa.	J5 .....4.85
Atlanta	A11 .....5.10
Alton,Ill.	L1 .....5.05
Bartonville,Ill. (1)	K4 ..4.85
Buffalo	W12 .....4.85
Chicago	W13 .....5.10
Cleveland	A7, C20 ....4.85
Crawfordsville,Ind.	M8.5.10
Donora,Pa.	A7 .....4.85
Duluth,Pa.	A7 .....4.85
Fairfield,Ala.	T2 .....4.85
Fostoria,O. (24)	S1 ...5.35
Houston	S5 .....5.25
Johnstown,Pa.	B2 .....4.85
Joliet,Ill.	A7 .....4.85
KansasCity,Mo.	S5 ...5.45
Kokomo,Ind.	C16 .....4.95
LosAngeles	B3 .....5.80
Minnequa,Colo.	C10 ...5.10
Monessen,Pa.	P7 .....5.10
Newark, 6-8 ga.	I-1 .5.50
No.Tonawanda	B11 ...4.85
Palmer,Mass.	W12 ...5.15
Pittsburg,Calif.	C11 ...5.80
Portsmouth,O.	P12 ...5.25
Rankin,Pa.	A7 .....4.85
So.Chicago,Ill.	R2 .....4.85
So.SanFrancisco	C10....5.80
SparrowsPoint,Md.	B2..4.95
Sterling,Ill. (1)	N15 ...4.85
Struthers,O.	Y1 .....4.85
Torrance,Calif.	C11 ...5.80
Waukegan,Ill.	A7 .....4.85
Worcester,Mass.	A7, T6.5.15

WIRE, Cold-Rolled Flat

Anderson,Ind.	G6 ....6.20
Buffalo	W12 .....6.35
Cleveland	A7 .....5.85
Crawfordsville,Ind.	M8..6.20
Detroit	D2 .....6.20
Dover,O.	G6 .....6.20
Fostoria,O.	S1 .....6.00
Kokomo,Ind.	C16 .....5.70
FranklinPark,Ill.	T6 ..6.20
Massillon,O.	R8 .....5.85
Monessen,Pa.	P16 ....5.85
Monessen,Pa.	P7 .....6.10
NewHaven,Conn.	D2 ...6.50
Pawtucket,R.I. (12)	N8..6.85
Trenton,N.J.	R5 .....6.15
Worcester	A7 .....6.15
Worcester	T6 .....6.50
Worcester	W12 .....6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill.	K4 ....8.50
Monessen,Pa.	P16 ....8.50
Roebling,N.J.	R5 .....8.80
SparrowsPoint,Md.	B2 .8.60
Johnstown,Pa.	B2 .....8.50

WIRE, Tire Bead

Bartonville,Ill. (1)	K4..10.90
Monessen,Pa.	P16 ....11.40
Roebling,N.J.	R5 .....11.55

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Aliquippa	J5 ....10.15	12.15
Bartonville(1)	K4 10.25	11.95
Cleveland	A7 ..10.25	12.15
Crawfrdsville	M8.10.30	12.00
Fostoria,O.	S1 ..10.40	13.00
Johnstown	B2 ..10.25	12.15
Kokomo	C16 ...10.25	11.95
Minnequa	C10 ..10.40	12.40
Palmer,Mass.	W12.10.25	12.15
Pitts.Cal.	C11 ..10.60	12.50
Prtsmth. (18)	P12.10.55	12.30
SparrowsPt.	B2..10.35	12.25
Waukegan	A7 ..10.25	12.15

WIRE, MB Spring, High Carbon

Aliquippa,Pa.	J5 .....6.25
Alton,Ill.	L1 .....6.45
Bartonville,Ill. (1)	K4 ..6.25
Buffalo	W12 .....6.25
Cleveland	A7 .....6.25
Donora,Pa.	A7 .....6.25
Duluth	A7 .....6.25
Fostoria,O.	S1 .....6.25
Johnstown,Pa.	B2 .....6.25
LosAngeles	B3 .....7.20
Milbury,Mass. (12)	N6 .8.05
Monessen,Pa.	P7, P16 .6.25
Palmer,Mass.	W12 ...6.55
Pittsburg,Calif.	C11 ...7.20
Roebling,N.J.	R5 .....6.55
Portsmouth,O.	P12 ...6.25
So.Chicago,Ill.	R2 .....6.25
So.SanFrancisco	C10 ...7.20
SparrowsPoint,Md.	B2 .6.35
Struthers,O.	Y1 .....6.25
Trenton,N.J.	A7 .....6.55
Waukegan,Ill.	A7 ....6.25
Worcester	A7, T6, W12.6.55
Worcester,Mass.	J4 ...6.75

WIRE, Fine & Weaving(8" Coils)

Bartonville,Ill. (1)	K4 ..8.90
Buffalo	W12 .....8.90
Chicago	W13 .....8.90
Cleveland	A7 .....8.90
Crawfordsville,Ind.	M8..8.95
Fostoria,O.	S1 .....8.90
Johnstown,Pa.	B2 .....8.90
Kokomo,Ind.	C16 .....8.90
Monessen,Pa.	P16 .....8.90
Palmer,Mass.	W12 .....9.20
Portsmouth,O.	P12 .....8.90
Roebling,N.J.	R5 .....9.20
Waukegan,Ill.	A7 ....8.90
Worcester,Mass.	A7 T6.9.20

WIRE, Barbed

	Col.
AlabamaCity,Ala.	R2 ...136
Aliquippa,Pa.	J5 140
Atlanta	A11 143
Bartonville,Ill. (19)	K4 ..143
Crawfordsville,Ind.	M8 .145
Donora,Pa.	A7 140
Duluth,Minn.	A7 140
Fairfield,Ala.	T2 140
Houston,Tex.	S5 148
Johnstown,Pa.	B2 140
Joliet,Ill.	A7 140
KansasCity,Mo.	S5 152
Kokomo,Ind.	C16 142
Minnequa,Colo.	C10 ...146
Monessen,Pa.	P7 145
Pittsburg,Calif.	C11 ...160
Portsmouth,O. (18)	P12..147
Rankin,Pa.	A7 140
So.Chicago,Ill.	R2 136
So.SanFran.,Calif.	C10 .160
SparrowsPoint,Md.	B2 .142
Sterling,Ill. (1)	N15 140

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala.	R2 ..123
Atlanta	A11 126
Bartonville,Ill. (19)	K4 .123
Crawfordsville,Ind.	M8 .132
Donora,Pa.	A7 123
Duluth,Minn.	A7 123
Fairfield,Ala.	T2 123
Joliet,Ill.	A7 123
KansasCity,Mo.	S5 135
Kokomo,Ind.	C16 125
Minnequa,Colo.	C10 128
Pittsburg,Calif.	C11 147
So.Chicago,Ill.	R2 123
So.SanFran.,Calif.	C10 .147
SparrowsPoint,Md.	B2 ..125
Sterling,Ill. (1)	N15 123

WIRE, Upholstery Spring

Aliquippa,Pa.	J5 .....5.90
Alton,Ill.	L1 .....6.10
Buffalo	W12 .....5.90
Cleveland	A7 .....5.90
Donora,Pa.	A7 .....5.90
Duluth,Minn.	A7 .....5.90
Johnstown,Pa.	B2 .....5.90
LosAngeles	B3 .....6.85
Monessen,Pa.	P7, P16 .5.90
NewHaven,Conn.	A7 ..6.20
Palmer,Mass.	W12 ....6.20
Pittsburg,Calif.	C11 ...6.85
Portsmouth,O.	P12 ...5.90
Roebling,N.J.	R5 .....6.20
So.Chicago,Ill.	R2 .....5.90
So.SanFrancisco	C10 ...6.85
SparrowsPoint,Md.	B2 .6.00
Torrance,Calif.	C11 ...6.85
Trenton,N.J.	A7 .....6.20
Waukegan,Ill.	A7 .....5.90
Worcester,Mass.	A7 ...6.20

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala.	R2 ..126
Ala,City,Ala.	17-18ga.R2 213
Aliquippa,Pa.	9-14½ga.J5 130
Atlanta	A11 133
Bartonville,Ill. (19)	K4 ..130
Crawfordsville,Ind.	M8 .132
Donora,Pa.	A7 130
Duluth,Minn.	A7 130
Fairfield,Ala.	T2 130
Houston,Tex.	S5 138
Johnstown,Pa.	B2 130
Johnstown,17ga.,	6" B2 .204
Johnstown,17ga.,	4" B2 .207
Joliet,Ill.	A7 130
KansasCity,Mo.	S5 142
Kokomo,Ind.	C16 132
Minnequa,Colo.	C10 ...138
Monessen,Pa.	P7 135
Pittsburg,Calif.	C11 ...153
Portsmouth,O. (18)	P12 .137
Rankin,Pa.	A7 130
So.Chicago,Ill.	R2 126
Sterling,Ill. (1)	N15 130

FENCE POSTS

ChicagoHts.,Ill.	C2 140
Duluth,Minn.	A7 125
Franklin,Pa.	F3 140
Huntington,W.Va.	W7 ...140
Johnstown,Pa.	B2 140
Marion,O.	P11 140
Minnequa,Colo.	C10 130
Moline,Ill.	R2 136
So.Chicago	R2 140
Tonawanda,N.Y.	B12 ...140
Williamsport,Pa.	S19 ...150

TRACK BOLTS (20) Treated

KansasCity,Mo.	S5 .....9.85
Lebanon,Pa..	(32) B2 ..9.85
Minnequa,Colo.	C10 ...9.85
Pittsburgh	O3, P14 ..9.85
Seattle	B3 .....10.35

NAILS & STAPLES, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala.	R2 ..118
Aliquippa,Pa.	(13) J5 ..118
Atlanta	A11 121
Bartonville,Ill.	(19) K4 ..118
Chicago,Ill.	W13 118
Cleveland	A9 125
Crawfordsville,Ind.	M8 .122
Donora,Pa.	A7 118
Duluth,Minn.	A7 118
Fairfield,Ala.	T2 118
Galveston,Tex.	D7 126
Houston,Tex.	S5 128
Johnstown,Pa.	B2 118
Joliet,Ill.	A7 118
KansasCity,Mo.	S5 130
Kokomo,Ind.	C16 130
Minnequa,Colo.	C10 123
Monessen,Pa.	P7 124
Pittsburg,Calif.	C11 ...127
Portsmouth,O.	P12 124
Rankin,Pa.	A7 118
So.Chicago,Ill.	R2 118
SparrowsPoint,Md.	B2 ..120
Sterling,Ill. (1)	N15 118
Torrance,Calif.	C11 138
Worcester,Mass.	A7 124

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa.	A3 .$7.35
Wheeling,W.Va.	W10 ..7.35

TIE PLATES

Fairfield,Ala.	T2 .....4.50
Gary,Ind.	U5 .....4.50
Ind.Harbor,Ind.	I-2 ....4.50
Lackawanna,N.Y.	B2 ..4.50
Minnequa,Colo.	C10 ....4.50
Pittsburg,Calif.	C11 ...4.65
Seattle	B3 .....4.65
Steelton,Pa.	B2 .....4.50
Torrance,Calif.	C11 ....4.65

JOINT BARS

Bessemer,Pa.	U5 .....4.70
Fairfield,Ala.	T2 .....4.70
Ind.Harbor,Ind.	I-2 ....4.70
Joliet,Ill.	U5 .....4.70
Lackawanna,N.Y.	B2 ..4.70
Minnequa,Colo.	C10 ....4.70
Steelton,Pa.	B2 .....4.70

STANDARD TRACK SPIKES

Ind.Harbor,Ind.	I-2, Y1.6.15
KansasCity,Mo.	S5 ...6.40
Lebanon,Pa.	B2 .....6.15
Minnequa,,Colo.	C10 ...6.15
Pittsburgh	J5 .....6.15
Seattle	B3 .....6.65
So.Chicago,Ill.	R2 ....6.15
Struthers,O.	Y1 .....6.15
Youngstown	R2 .....6.15

AXLES

Ind.Harbor,Ind.	S18 ...5.60
Johnstown,Pa.	B2 ....5.60

RAILS

	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa.	U5	3.60	3.50	3.55	4.00
Ensley,Ala.	T2	3.60	3.50	...	4.00
Fairfield,Ala.	T2	...	...	...	4.00
Gary,Ind.	U5	3.60	3.50	3.55	...
Huntington,W.Va.	W7 ..	...	...	...	5.00
Ind. Harbor,Ind.	I-2	3.60	3.50	3.55	...
Johnstown,Pa.	B2	...	...	...(16)	4.00
Lackawanna	B2	3.60	3.50	...	4.00
Minnequa,Colo.	C10	3.60	3.50	...	4.50
Steelton,Pa.	B2	3.60	3.50	...	...
Williamsport,Pa.	S19 ...	...	...	...	4.75

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.,Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,Eaton Mfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 YoungstownSheet&Tube

TOOL STEEL

—Grade by Analysis—

Grade	$ per lb	W	Cr	V	Co	Mo	$ per lb
Reg. Carbon .	0.230	20.25	4.25	1.6	12.25	..	. 3.535-3.675
Exera Carbon.	0.270	19	4	2	7	..	..... 2.460
Spec. Carbon.	0.325	18.25	4.25	1	4.75	..	..... 2.125
Oil Hardening.	0.350	18	4	2	9	..	. 2.445-2.450
5%CrHotWrk.	0.350	13.5	4	3	..	..	..... 1.60¼
Hi-Carbon-Cr.	0.635	6.4	4.5	1.9	..	5	.. 0.96-0.965
18W,4Cr,1V	1.505	6	4	3	..	6	..... 1.190
18W,4Cr,2V	1.650	1.5	4	1	..	8.5	..... 0.810

Tool steel producers include: A4, A8, B2, B3, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2, V3.

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) Add 0.05c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ⅛" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. edge or square edge.
(33) To jobbers, deduct 20 cents.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

These are the special purpose steels that set Crucible apart from most other steel companies. For these special steels must be so carefully compounded, and so sensitively handled that, in most cases, they cannot be mass produced.

Such steels include those designed for use under severe conditions of heat or cold, stress, strain, or wear. For example: Crucible high-speed tool steels are in the whirring machines that cut and shape the toughest metals; Crucible hollow drill steels work around-the-clock digging mines and quarries, and Crucible stainless steels put a sparkle with a purpose in our kitchens.

If you have an application that calls for a special steel, Crucible's metallurgical staff stands ready to help you. CRUCIBLE STEEL COMPANY OF AMERICA, Chrysler Building, New York 17, N. Y.

CRUCIBLE first name in special purpose steels

51 years of Fine *steelmaking*

Spaulding Works, Harrison, N. J. • Midland Works, Midland, Pa. • Park Works, Pittsburgh, Pa. • Spring Works, Pittsburgh, Pa. National Drawn Works, East Liverpool, Ohio • Sanderson-Halcomb Works, Syracuse, N. Y. • Trent Tube Company, East Troy, Wisconsin

You saw this ad in the Saturday Evening Post, Time, Newsweek, Business Week

especially tool steels!

Crucible Tool Steels have been pampered pets every day of the 51 years Crucible has led in this highly specialized field. That's why tool steel users, assured of getting what they want from Crucible, have kept us the country's number one tool steel producer.

Since Industry is constantly opening new fields that require new tool steels, Crucible's interest in their further development and improvement goes on unabated. You can profit from the wealth of knowledge gained by Crucible in the application of these steels to thousands of uses. The unparalleled experience of our metallurgists is freely available to you.

That's why it pays to get *all* your tool steel requirements from Crucible.

write for your selector today

If you haven't gotten your handy tool for selecting tool steels, write: Dept. S, Crucible Steel Company of America, 405 Lexington Avenue, New York 17, New York

3 colors, 9" diameter

CRUCIBLE first name in special purpose steels

51 years of Fine *steelmaking*

TOOL STEELS

Branch Offices and Warehouses: ATLANTA • BALTIMORE • BOSTON • BUFFALO • CHARLOTTE • CHICAGO • CINCINNATI • CLEVELAND • DENVER • DETROIT HOUSTON • INDIANAPOLIS • LOS ANGELES • MILWAUKEE • NEWARK • NEW HAVEN • NEW YORK • PHILADELPHIA • PITTSBURGH • PROVIDENCE • ROCKFORD SAN FRANCISCO • SEATTLE • SPRINGFIELD, MASS. • ST. LOUIS • SYRACUSE • TORONTO, ONT. • WASHINGTON, D. C.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Black— A	B	C	—Galvanized— D	E	F
⅛	5.5c	0.24	34.0	32.0	29.0	+0.5	+2.5	+5.5
¼	6.0	0.42	28.5	26.5	23.5	+3.5	+5.5	+8.5
⅜	6.0	0.57	23.5	21.5	18.5	+10.0	+12.0	+15.0
½	8.5	0.85	36.0	34.0	35.0	12.0	10.0	11.0
¾	11.5	1.18	39.0	37.0	38.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	42.0	44.0	41.0	20.5	22.5	19.5
1½	27.5	2.78	42.5	41.5	41.5	21.5	20.0	20.5
2	37	3.68	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	21.0

Column A: Etna, Pa. N2; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜". Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼ % on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y1; Alton, Ill., 2 points lower discount L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 5½ % on ⅛", plus 6% on ¼", plus 12% on ⅜"; Sharon, Pa. M6, plus 2.5 on ⅛", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Following quote only on ⅛" and larger: Lorain, O. N3; Youngstown R2, and 15½ % on 3½" and 4"; Youngstown Y1. Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½ points lower on 1¼", 2 points lower on 1½" and 2", 1½ points lower on 2½" and 3"; Etna, Pa. N2 and 17½ % on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Galv. B	Elec. Weld Black C	Galv. D
2	37.0c	3.68	29.5	8.0	29.5	8.0
2½	58.5	5.82	32.5	11.5	32.5	11.5
3	76.5	7.62	32.5	11.5	32.5	11.5
3½	92.0	9.20	34.5	13.5	34.5	13.5
4	$1.09	10.89	34.5	13.5	34.5	13.5
5	1.48	14.81	37.0	16.0	37.0	16.0
6	1.92	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft. mil; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	C.D.	Elec. Weld H.R.	C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2½	12	26.92	32.97	26.98	31.76
2¾	12	29.65	36.32	29.57	34.76
3	12	32.11	39.33	31.33	36.84
3½	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	—Plates— Carbon Base 10%	20%	—Strip— Cold-Rolled Carbon Base Both Sides	—Sheets— Carbon Base 10%	20%	Cu Base Both Sides
302	....	....	....	19.75	26.24–27.50	77.00
304	25.00	29.50	....	24.50	27.50–27.77	77.00
309	30.50	35.00	....	....	....	....
310	36.50	41.00	....	....	....	144.00
316	29.50	34.00	....	26.00	35.92–36.50	....
317	34.50	39.00	....	....	....	....
318	33.50	38.00	....	....	....	....
321	26.50	31.00–32.00	....	23.00	33.00	111.00
347	27.50	32.00	....	24.00	33.50–33.83	130.00
405	21.25	27.75	....	....	....	....
410	20.75	27.25	....	....	....	....
Nickel	33.55	45.15	41.00	54.00	....	....
Inconel	41.23	54.18	....	....	....	165.00
Monel	34.93	46.28	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....

* Deoxidized, † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:

½-in. & smaller diam.	15
9/16-in. & ⅝-in.	18.5
¾-in. and larger	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.:	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up bolts	31

NUTS

	Reg.	Hvy.
H.P. & C.P. Square:		
½-in. & smaller	15	15
9/16-in. & ⅝-in.	12	6.5
¾-in.-1½-in.	9	1
1⅝-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
9/16-in. & ⅝-in.	16.5	6.5
¾-in.-1½-in.	12	2
1⅝-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
9/16-in. & ⅝-in.	23	17.5
¾-in. & 1½-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller.	35	28.5
9/16-in. & ⅝-in.	29.5	22
¾-in.-1½-in.	24	15
1⅝-in. & larger.	13	8.5
		Light
7/16-in. & smaller	35	
½-in. to ⅝-in.	28.5	
¾-in. to 1½-in.	26	

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	42
¾-in. through 1 in.	34
Longer than 6 in.:	
⅝-in. & smaller	26
¾-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.85c

7/16-in. under 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..List to list-plus-$1.

FLUORSPAR

Metallurgical grade, f. o. b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

—Inches— Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
	CARBON	
35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Balt., Types 301-347 sheet, quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, except 303 and 309 E2.

Brackenridge, Pa., Sheets A4 sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 and 0.25c lower on Types 302, 304, 321, 347; 0.50c lower on Types 309 and 316 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip, W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip, except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol 30.00-35.00

Toluol, one deg. .26.00-33.00

Industrial xylol .25.00-33.50

Per ton bulk, ovens

Sulphate of ammonia .$32-$45

Cents per pound, ovens

Phenol, 40 (carlots, non-returnable drums) ..17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron Cents

98+% Fe, carlots.. 17.00

Swedish, c.i.f. New York, in bags .8.85-9.95

Electrolytic Iron:

Annealed, 99.5% Fe. 42.50

Unannealed, 99 + % Fe 36.50

Unannealed, 99 + % Fe (minus 325 mesh) 58.50

Powder Flakes 48.50

Carbonyl Iron:

97.9-99.8%, size 5 to 10 microns ..83.00-148.00

Aluminum:

Carlots, freight allowed 29.50

Atomized, 500 lb drums, freight allowed 33.50

Antimony 75.85

Brass, 10-ton lots .30.00-33.25

Bronze, 10-ton lots 51.25-60.00

Phosphor-Copper, 10 ton lots 50.00

Copper:

Electrolytic 37.25-46.25

Reduced 33.75-37.00

Lead 25.50

Magnesium 75.00-85.00

Manganese:

Minus 100-mesh 57.00

Minus 35 mesh 52.00

Minus 200 mesh 62.00

Nickel unannealed 86.00

Nickel-Silver, 10-ton lots 45.00

Silicon 38.50

Solder (plus cost of.. metal) 8.50

Stainless Steel, 302 .. 83.00

Zinc, 10-ton lots..23.00-30.50

Tungsten Dollars

Melting grade, 99%, 60 to 200 mesh, freight allowed:

1000 lb and over .. 6.00

Less than 1000 lb .. 6.15

98.8% minus 65 mesh, freight allowed:

1000 lb and over ... 4.15

Less than 1000 lb .. 4.25

Molybdenum:

99.9%, minus 200 mesh 3.25

Chromium, electrolytic 99% Cr min. 3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvil,fur. .$14.50-15.00

Connelsvil,fdry. .17.00-18.00

New River foundry ...21.30

Wise county, foundry ..15.95

Wise county, furnace ..15.20

OVEN FOUNDRY COKE

Kearny, N. J., ovens..$22.75

Everett, Mass., ovens New England, del...*24.80

Chicago ovens.....23.00

Chicago, del 24.50

Terre Haute, ovens ...22.50

Milwaukee, ovens 23.75

Indianapolis, ovens 22.75

Chicago, del. 26.42

Cincinnati, del. 25.85

Detroit, del 26.85

Ironton, O., ovens 22.50

Cincinnati, del. 25.12

Painesville, O., ovens..24.00

Cleveland, del. 25.82

Erie, Pa., ovens 23.50

Birmingham, ovens ...20.30

Birmingham, del. ...21.60

Philadelphia, ovens ...22.70

NevilleIsland,Pa., ovens 23.00

Swedeland, Pa., ovens..22.60

St. Louis, ovens

St. Louis, del 25.40

Portsmouth, O., ovens..22.50

Cincinnati, del 25.12

Detroit, ovens 24.00

Detroit, del. 25.00

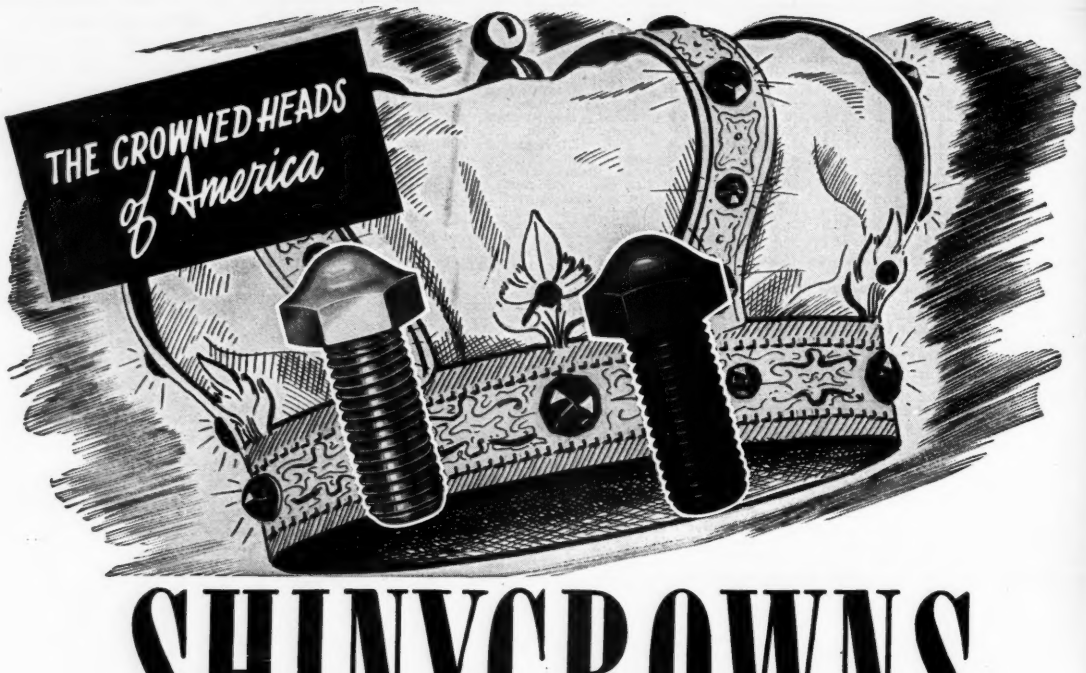
Buffalo, del. 26.89

Flint, del. 26.59

Pontiac, del. 25.47

Saginaw, del. 26.92

* Or within $4.15 freight zone from works.



SHINYCROWNS

THE KING OF HEX HEADS

A Crowning Achievement in Cap Screw Design

FOR GENERAL USE

SHINYCROWNS give that "New Look" to assembly where appearance, ultra-quality, and sales interest are paramount. For that "finishing touch" to your assembly, specify SHINYCROWNS, the last word in ornamental Hexagon Head design.

SHINYCROWNS are furnished in C-1018 steel, in sizes ¼" diameter through ½" diameter inclusive, in both coarse and fine threads, in plain, zinc, cadmium, nickel, or chrome plate. Price governed by quantity desired—bulk shipments only.

SPECIAL NOTE: Also furnished with polished crown to secure highest possible luster, mirror finish.

FOR SPECIAL USE

SHINYCROWNS - HexHard have that "New Look" appearance with the added features of hard Hexagon Heads and soft, tough threads obtained by a special heat treatment—for use where tightening and loosening for adjustment purposes is necessary.

SHINYCROWNS - HexHard are furnished in special heat treating material to secure the above features, in standard sizes ¼" diameter through ½" diameter inclusive, in both coarse and fine threads, in plain, zinc, cadmium, nickel, or chrome plate. Price governed by quantity desired — bulk shipments only.

SPECIAL NOTE: Also furnished in ⅜" diameter special 20 thread where specified.

SHINYCROWNS - HexHard with hard Hexagon Heads are recommended to eliminate poor wrench fit resulting in rounded corners from constant adjustment.

Complete Information and Samples furnished on request.

The FERRY CAP & SET SCREW Co.

2159 SCRANTON ROAD • • • • • CLEVELAND 13, OHIO

Pioneers and Recognized Specialists Cold Upset Screw Products since 1907

CAP AND SET SCREWS • CONNECTING ROD BOLTS • MAIN BEARING BOLTS • SPRING BOLTS AND SHACKLE BOLTS • HARDENED AND GROUND BOLTS SPECIAL ALLOY STEEL SCREWS • VALVE TAPPET ADJUSTING SCREWS • AIRCRAFT ENGINE STUDS • ALLOY STEEL AND COMMERCIAL STUDS • FERRY PATENTED ACORN NUTS

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	6.27	7.29	8.44	6.59	...	6.42	7.29	9.25	6.40	6.58	8.04
New York(c'try)	5.97	6.99	8.14	6.29	...	6.12	6.99	8.95	6.10	6.28	7.74
Boston (city) ..	6.40	7.20	8.49	6.35	...	6.25	7.04	9.25	6.40	6.98	7.88
Boston (c'try).	6.20	7.00	8.29	6.15	...	6.05	6.84	9.05	6.20	6.78	7.68
Phila. (city) ..	6.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try)..	5.90	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	6.05	7.15
Balt. (city) ...	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	6.00	7.64
Balt. (c'try) ..	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	5.80	7.44
Norfolk, Va. ..	6.50	...	...	6.70	...	6.55	7.70	...	6.60	6.50	8.00
Richmond, Va..	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	6.05	7.80
Wash. (w'hse).	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.)..	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65††[5]	6.00	6.25	7.55
Buffalo (w'hse)	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45††[5]	5.80	6.05	7.35
Pitts. (w'hse)..	5.60	6.40*	7.75	5.65-5.95	6.90	5.55	6.40	10.10††	5.70	5.75	7.00
Detroit (w'hse)	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.82
Cleve. (w'hse).	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	5.82	5.92	7.12
Cincin. (city)..	6.02	6.59	7.34	5.95	...	5.95	6.57	...	6.24	6.34	7.50
Chicago (city).	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (w'hse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80	7.00
Milwau. (city).	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try)	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.)	6.05	6.85	8.20	6.00	...	6.00	6.85	10.55	6.23	6.33	7.53
St. L. (w'hse).	5.85	6.65	8.00	5.80	...	5.80	6.65	10.35	6.03	6.13	7.33
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
KansCity(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city).	5.75	6.55	6.90[2]	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm(w'hse)	5.60	6.40	6.75[2]	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.55	8.10	9.05[3]	6.60	8.90	6.55	7.75	...	6.55	6.60	9.20
L. A. (w'hse).	6.35	7.90	8.85[3]	6.40	8.70	6.35	7.55	...	6.35	6.40	8.70
Seattle-Tacoma.	6.65	7.80[4]	8.90[3]	6.60	...	6.45	8.20	...	6.45	6.50	8.60
San Francisco..	7.05	8.60[3]	9.20[3]	7.30	...	6.75	9.10	11.15	6.65	6.75	8.80

Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [4]—3500 lb and over; [5]—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports. After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit, del. E Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematities	17.00
Brazilian iron ore, 68-69%	24.00-25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.6c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	$32.00
Rhodesian	
45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00
Domestic—rail nearest seller	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 21.75c per lb of contained Cr. c.l., packed 22.65c, ton lot 23.80c, less ton 25.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%,) Contract, carload, lump, bulk, max. 0.03% C 33.60c per lb of contained Cr, 0.04% C 31.50c, 0.06% C 30.50c, 0.10% C 30.00c, 0.15% C 29.75c, 0.20% C 29.50c, 0.50% C 29.25c, 1% C 29.00c, 1.50% C 28.85c, 2% C 28.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 23.25c per lb of contained Cr. C.l., packed 24.15c, ton 25.50c, less ton 27.25c. Delivered Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8 M x D, 16.35c per lb of alloy; ton lot 17.2c; less ton lot, 18.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 21.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 21.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 36-39%, Al 7-9%, C 0.05% max.) 21.75c per lb of contained silicon plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min. 97% Cr and 1% Fe) Contract carload, 1" x D; packed, max 0.50% C grade, $1.08 per lb of contained chromium ton lot $1.10, less ton $1.12. Delivered. Spot add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.00c per lb of contained Si; packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

Note: Current prices on zirconium, calcium and briquetted alloys appeared on page 111, Oct. 29 issue; manganese, titanium and "other" ferroalloys, page 169, Nov. 5. Refractories prices were published on page 111, Oct. 29.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.5c per lb of contained Si, carload packed 18.7c, ton lot 19.85c, less ton 20.7c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 20.0c per lb of Si, c.l. packed 21.2c, ton lot 22.1c, less ton 23.1c. Add 1.5c for max, 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe.) Contract, basis f.ob. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 200 to 1999 lb 11.65c, smaller lots 12.15c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $3.10 per lb of contained V. Delivered, Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max., C 0.20% max.) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1"x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

TUNGSTEN ALLOYS*

Ferrotungsten: (70-80%). 10,000 lb W or more, $5.00 per lb of contained W; 20,000 lb W to 10,000 lb W, $5.10; less than 2000 lb W, $5.22.

Tungsten Powder: Carbon Reduced; (W 98.8% min.) 1000 lb or more, $6.00 per lb of contained W; less than 1000 lb W, $6.15.

*Government ceiling prices, effective May 7, 1951, f.o.b. Niagara Falls, N. Y., basis.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Oct. 23, 1951

STEELMAKING SCRAP COMPOSITE

Nov. 8	$43.00
Nov. 1	43.00
Oct. 1951	43.60
Nov. 1950	41.33
Nov. 1946	22.22

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	Grade 1 No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	—$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	—10.00
7. Mixed Boring & Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00
30. Hard Steel cut 2 ft & under	+ 5.00
31. Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices establishd for Grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and open-hearth furnaces or foundries.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

(6) Prices for Grade 30 may be charged only when sold to a gray iron foundry; otherwise price for Grade 20 will prevail.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 bundles less $15.00.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap.

2. No. 2 Heavy melting Steel	—$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats.	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, switches.	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angle, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.

(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1.)

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery.	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.

(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.
(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3. For preparing into:
(4) Grade No. 25, $6.
(5) Grade No. 19, $6.
(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) Grade No. 17 or No. 21, $11.
(8) Grade No. 18, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:
(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.
For preparing into:
(3) Grade No. 16, $4.
(4) Grade No. 17, $5.
(5) Grade No. 18, $7.
(6) Grade No. 21, $4.
(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:
(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commission shall be payable to a broker in excess of $1.

Premiums for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:

Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c.
Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa., 53c; Buffalo, 83c; Butler, Pa., 65c.
Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c.
Coatesville, Pa., 50c; Conshohocken, Pa., 26c.
Detroit, 95c; Duluth, Minn., 50c.
Harrisburg, Pa., 51c; Houston, 57c.
Johnstown, Pa., 75c.
Kansas City, Mo., 78c; Kokomo, Ind., 51c.
Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c.
Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c.
St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O., 51c.
Warren, Pa., 75c; Weirton, 70c.
Youngstown, 75c.

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	*35.00*
Mechanical Bundles	*31.50*
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	*32.00*
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory:	
Prep'd.	33.00
Unprep'd.	*31.00*
Short Steel Turnings	*32.00*
Cast Iron Grades*	
No. 1 Machinery Cast	*55.00*

* F.o.b. shipping point.

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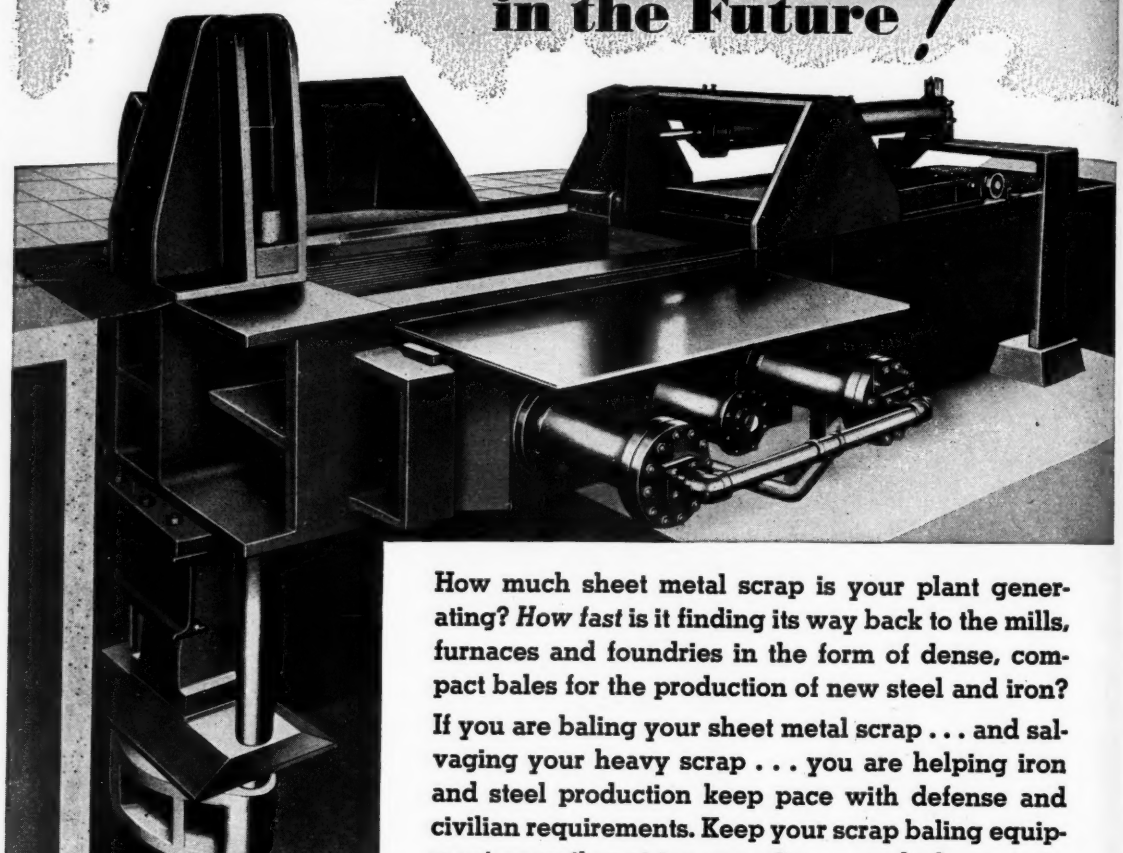

How much sheet metal scrap is your plant generating? *How fast* is it finding its way back to the mills, furnaces and foundries in the form of dense, compact bales for the production of new steel and iron?

If you are baling your sheet metal scrap . . . and salvaging your heavy scrap . . . you are helping iron and steel production keep pace with defense and civilian requirements. Keep your scrap baling equipment operating at top capacity . . . and *plan now* to expand and modernize your baling operations to meet future needs.

Galland-Henning offers you competent counsel on your baling problems, based on years of experience in the design, construction and installation of powerful, hydraulic scrap metal balers for steel mills, industrial plants and scrap yards.

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SCRAP METAL BALING PRESSES

The Metal Market

National Production Authority acts to increase flow of aluminum, copper and lead scrap to secondary smelters. Shortages will extend through second quarter of 1952

EFFORTS to augment supplies of nonferrous metals, especially aluminum, copper and lead, are being intensified. Production of these strategic materials could be raised if more scrap were available and vigorous action is being taken to increase shipments.

National Production Authority took action last week to divert the flow of aluminum scrap from primary producers to secondary smelters. The amounts of tolled and purchased scrap and secondary ingot which primary producers may receive during the fourth quarter of 1951 are limited to individual ceilings, based on each company's historical use of aluminum scrap. As a result of this directive, a minimum of about 5.5 million pounds of scrap aluminum will be diverted each month from primary producers to secondary smelters.

Supply of red metal scrap will not be sufficient to meet defense program needs in the first quarter of 1952, NPA officials forecast. To obtain scrap needed in the immediate future, NPA proposes the release of government-owned scrap, a joint compliance survey by NPA and OPS, acceleration of the industrial scrap program and reduction of the inventory period from 60 days to 30 days.

Violations Numerous—More than 100 cases where dealer inventories of copper scrap are in excess of the 60-day limitation have been discovered, NPA said. Dealers are warned that they will be prosecuted for wilful violation of the inventory limitation.

Refined copper production from scrap by custom smelters dropped in October from the normal 10,000 tons a month to 1680 tons, NPA said. Brass and bronze ingot production also dropped from about 35,000 tons a month to 22,000 tons in September.

A program to put lead scrap under allocation is being studied by NPA and will be made effective "as soon as possible." The allocation program, which has covered domestically produced soft primary lead since Sept. 1, will be extended to lead imports. December allocations are expected to be issued late this month.

Because demand for lead far exceeds supply, NPA has been forced to reduce the amounts of lead made available to all users, including storage battery manufactuers, the electric cable, paint and tetraethyl lead industries. Supplies of primary lead are short, principally because imports of concentrates have been curtailed and scrap lead supplies are inadequate. About 75 per cent of lead scrap comes from batteries. Although production of battery plates is normal, some smelters using this form of scrap are not getting one-tenth of their normal supply. NPA may issue a regulation to direct the movement of battery plate scrap from the dealer to the user along normal historical trade lines.

COPPER SCRAP BALERS

. . . urgently need more material

Magnesium Group To Meet

Seventh annual meeting of Magnesium Association, to be held in the Biltmore Hotel, New York, Nov. 15-16, will feature an industry display of civilian and military product applications of the world's lightest structural metal. A. W. Winston, Dow Chemical Co., Midland, Mich., is president of the association.

Rolled Zinc Output Rises

Production of rolled zinc increased in 1950 to 70,075 tons, valued at $28,368,498, from 57,987 tons, valued at $20,144,422, in 1949. Output of all rolled zinc items increased during the year. Strip and ribbon zinc production increased to 49,167 tons from 41,354 tons; sheet zinc, not over 0.1 inch thick, to 18,436 tons from 14,710 tons. Of the 70,075 tons of rolled zinc produced, 70 per cent was in the form of strip and ribbon zinc and 26 per cent as sheet zinc not over 0.1 inch thick.

The quantity of slab zinc consumed for rolled zinc products in 1950 increased 24 per cent from the 1949 figure, reports the Bureau of Mines. The total value of the rolled products, however, gained 41 per cent as the average price rose from 17.4 cents in 1949 to 20.2 cents in 1950.

Zinc rolling mills consumed 68,444 tons of slab zinc and 4516 tons of purchased zinc scrap in 1950 compared with 55,200 tons and 3802 tons, respectively, in 1949. In addition, 13,841 tons of strip and ribbon zinc were remelted and rerolled from scrap originating in fabricating plants operating in connection with zinc rolling mills.

New Mineral Discovered

A new mineral, previously unknown to science, has been found in Nevada and named "robinsonite" in honor of Dr. S. C. Robinson, Queen's University, Kingston, Ont. The discovery was made by Edgar H. Bailey of the Geological Survey, Department of Interior, while investigating quicksilver deposits at the Red Bird mine, Pershing county, Nevada. X-ray pictures show the mineral contains the typical pattern of boulangerite and a lead-antimony sulfide. The hardness, color and luster are the same as those for boulangerite. There are only about 1600 well-defined species of minerals.

Plans To Cast Magnesium

American Radiator & Standard Sanitary Corp., New York, is going to use its North Side Pittsburgh plant for production of magnesium castings for defense purposes. The company had closed the plant last month in anticipation of its conversion to production of enameled sinks.

Aluminum Capacity Climbs

Continuing progress in the aluminum industry's current expansion program was reported by producers at the recent meeting of the Aluminum Association in New York. The reports confirmed expectations that by the end of 1952 the nation's primary aluminum capacity will be about 60 per cent greater than the 1950 level and that additional capacity is scheduled to go into operation in 1953. The meeting brought together top executives of all primary aluminum producers and about 85 per cent of the nation's semi-fabricators of this strategic metal.

A. P. Cochran, Cochran Foil Co. Inc., Louisville, is president of the Association.

Production of primary aluminum continued to rise in August, totaling 73,816 tons compared with 72,698 tons in July and 63,006 tons in August, 1950. Power shortages in the Pacific northwest forced curtailment of operations in September. Increases in July and August resulted from expansion and reactivation programs within the industry and further production advances could be expected if sufficient power to produce the metal were available at all times, says Donald M. White, secretary, Aluminum Association, New York.

Aluminum sheet and plate shipped by member companies of the Association totaled 91,888,728 pounds during August, a decrease of 1,882,350 pounds from the July total, while shipments of foil increased nearly 1 million pounds.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c; 88-10-2 (No. 215) 38.50c; 80-10-10 (No. 305) 32.25c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 19.50c; brass special 19.75c; intermediate 20.00c, East St. Louis; high grade 20.85c, delivered.

Lead: Common 18.80c; chemical 18.90c; corroding 18.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.00c; grade 2, 17.75c; grade 3, 17.25c; grade 4, 16.50c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 103.00.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $220-$222 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.50 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 88.00c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill; effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18%, 53.14; phosphor-bronze grade A, 5%, 61.07.

Rod: Copper, hot-rolled 37.53; cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze, 95%, 41.30; 90% 40.82; red brass 85%, 39.83; 80%, 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29; commercial bronze, 90%, 43.79; red brass, 85% 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95%, 41.90; 90%, 41.42; red brass, 85%, 40.43; 80%, 39.96; best quality brass, 39.44.

(Base prices, effective Nov. 6, 1950)

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-30.42; l.c.l. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.l. 29.60-30.60, l.c.l. 30.10-31.10, 100-000 lb lots 29.35-30.35; magnet, del., 15,000 lb or more 34.50c, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	—Hexagonal— 17S-T4
0.125	52.0	....	....
0.156-0.0188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $24.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $24.00 per cwt. Traps and bends: List prices plus 80%.

ZINC

Sheets, 26.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 25.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 24.50-26.50c; over 12-in., 24.50-26.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb, 75.50c; 2000 to 10,000 lb, 76.50c, 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 77.7c; 100 or 350 lb drums only, 100 to 600 lb, 63.1c; 700 to 1900 lb, 60.6c; 2000 to 9900 lb, 58.9c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.19; 500 to 999 lb, $1.195; 200 to 499 lb, $1.20; less than 200 lb, $1.215. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums, 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.0009; more than 2000 lb, 98.09c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 87.23c; 100 lb kegs 88.23c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material. Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Unsweated zinc dross, 13.75c; new clippings and trimmings, 15.50c; engravers' and lithographers' plates, 15.50c; die cast slabs, min. 90% zinc, 13.75c; old zinc scrap, 12.25c; forming and stamping dies, 12.25c; new die cast scrap, 11.75c; old zinc die cast radiator grille, 11.50c; old die cast scrap, 10.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 19.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb, or a flat price of 11.25c a pound of battery plates. Used storage batteries (in boxes) drained of liquid, 7.65c for 15,000 lb or more; 7.45c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 17.25c in lots of 20,000 lb or more; 16.50c in lots under 20,000 lb.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

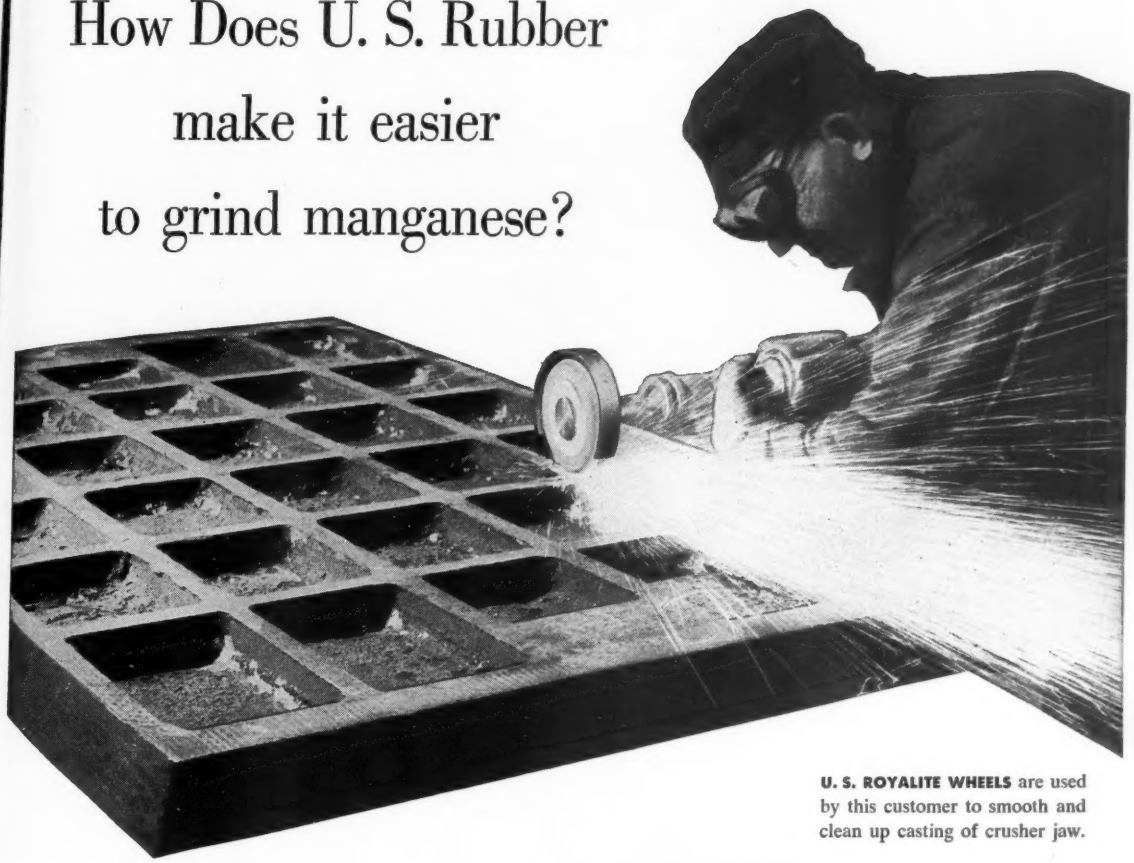
Segregated plant scrap: 2s solids, copper free, 10.50, high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00 dural type, 9.00; Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Nov. 1-8	24.50	18.80	19.50	103.00	19.00	42.00	56.50	88.00
Oct. 5-31	24.50	18.80	19.50	103.00	19.00	42.00	56.50	88.00
Oct. 4	24.50	18.80	19.50	103.00	19.00	42.00	56.50	84.75
Oct. 2-3	24.50	18.80	19.50	103.00	19.00	42.00	56.50	90.16
Oct. 1	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Oct. Avg.	24.50	18.726	19.426	103.00	19.00	42.00	56.50	88.12
Sept. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Aug. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
July Avg.	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June Avg.	24.50	16.80	17.50	117.962	19.00	42.00	56.50	88.492
May Avg.	24.50	16.80	17.50	139.923	19.00	42.00	50.50	90.16
Apr. Avg.	24.50	16.80	17.50	145.735	19.00	42.00	50.50	90.16
Mar. Avg.	24.50	16.80	17.50	145.730	19.00	42.00	50.50	90.16

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

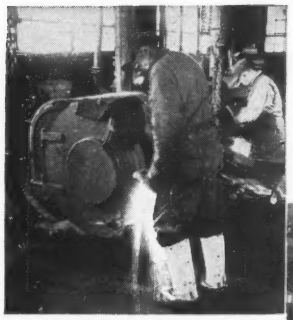
How Does U. S. Rubber make it easier to grind manganese?



U. S. ROYALITE WHEELS are used by this customer to smooth and clean up casting of crusher jaw.

By developing wheels especially designed to be used on manganese, U.S. Rubber technicians make it easier to handle this extremely tough steel.

Bring your questions on grinding wheels to "U.S." engineers. They will make sure you receive properly engineered wheels in which you can have complete confidence.



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UNITED STATES RUBBER COMPANY

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WILLSON PRODUCTS, INC., 233 Washington Street, Reading, Pa.

Dependable Products Since 1870

Steel Bars . . .

Bar Prices, Page 145

Detroit—Improvement in delivery is reported by some automotive consumers of alloy bars. In one instance bars promised for mid-December delivery are now expected a month earlier. Shortage of bars, however, continues the major worry of automakers, excluding copper.

New York—Despite nullification by NPA of the first-come-first-served order the day before its effective date, Nov. 2, bar producers experienced a flurry of demand for January.

Cleveland—Elimination of the 10-per cent tonnage set-aside for first-come first-served customers in the last 15 days of the lead period for January bookings came just in time to save bar producers from a flood of orders which they could not possibly handle.

Chicago — Outlook for hot-rolled bars has lost some of its tightness in recent weeks as result of lessened demand from the farm equipment industry.

Sheets, Strip . . .

Sheet and Strip Prices, Page 145 & 146

Pittsburgh—District producers feel that NPA's cancellation of the 10 per cent reserve order so they can now accept up to 100 per cent of their monthly capacity in authorized CMP orders on a pick and choose basis is a step in the right direction in that they can better serve their regular customers.

Demand is currently holding up with no signs of weakness noted. Closer approximation of supply and demand is noted in terne and electrical sheets.

Boston—Contributing to improvement in narrow cold strip supply is the fact for some weeks producers of hot-rolled have been meeting allocations to converters.

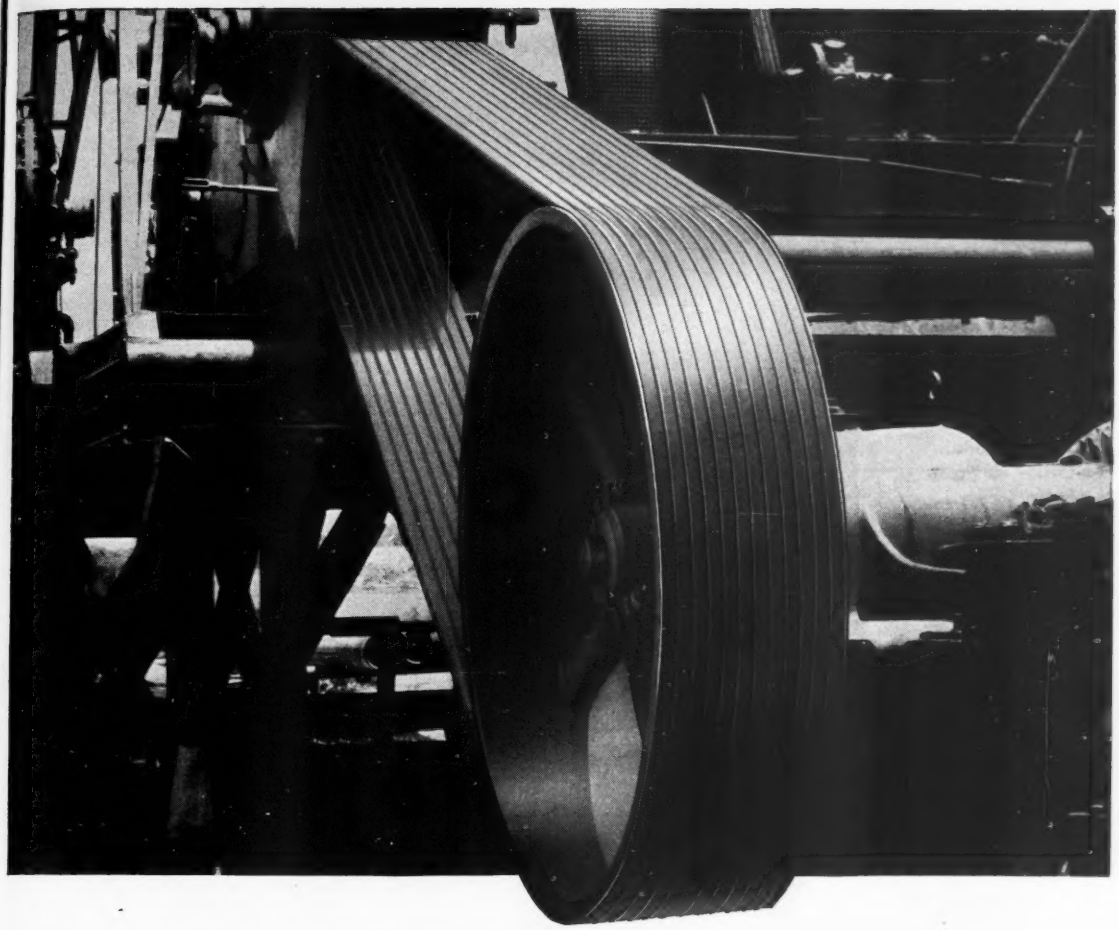
New York—Last minute cancellation by the National Production Authority of the amendment calling upon mills to set aside 10 per cent of their January production for buyers coming in on a first-come-first-served basis in the final 15 days before expiration of lead time of a given product, came too late to forestall a flurry in demand.

Philadelphia—Sheet consumers fairly deluged producers with orders for January, for acceptance on a first-come-first served basis.

Cleveland—Producers have marked up their galvanized sheet prices to reflect the early October increase of 2 cents per pound in zinc. This action had been delayed by OPS pending a 20-day notification period by sellers.

Detroit—Some large factors here in conversion are reported attempting to close out their deals. Some middlemen in conversion activities are understood to be unloading at the best price they can get. This is drastically below the offering price of a few months ago.

Washington — Navy purchases of stainless steel sheets have been heavy from at least four producers. Among those booking orders are Eastern Stainless Steel Co., Baltimore, 305 tons, and Allegheny Ludlum Steel Corp., Pittsburgh, 110 tons.



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Remember, also, that Bull Dogs are processed for *minimum stretch.* You'll see the operating benefits in reduced slippage and the elimination of repeated adjustments.

Durable Covers are another "more for your money" advantage — and worth remembering. Bull Dog covers are closely woven of heavy, bias cut fabric. They can withstand the punishing wear of the sheave while sealing the belt against moisture, dirt and grease.

Remember, too, that the *specially engineered* BWH cord section is outstanding in high tensile strength. This means you'll get the superior load carrying capacity you want — and the ability to absorb shock loads. What's more, when you install Bull Dogs in sets (and it's highly recommended) you are matching the uniform superiority of one Bull Dog belt with another.

TOUGH PROBLEMS INVITED— Ask us or your nearest BWH distributor about your V-belts, transmission belting, conveyor belting and hose problems. He is a specialist in making rubber products work *better, longer.*

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- Extra safety
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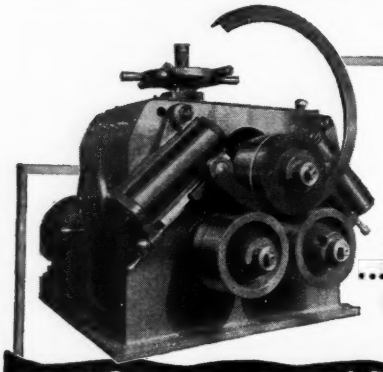
LESCHEN WIRE ROPE

Consult our Engineering Department for specific recommendations. A. LESCHEN & SONS ROPE CO., 5909 Kennerly Ave., St. Louis 12, Missouri. Distributors in all principal cities.



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Obviously one, two, six or even sixteen angles won't justify the purchase of this modern Thomas machine. But if your production calls for circles or segments from angles, flats, rounds or other shapes in quantities, the THOMAS ANGLE BENDER may be the solution to *your* need for *greater production at less cost!* *Write for Bulletin 314.*

PUNCHES • SHEARS
SPACING TABLES
PRESSES • BENDERS

17

THOMAS
MACHINE MANUFACTURING COMPANY
PITTSBURGH, 23, PA.

Plates . . .

Plate Prices, Page 145

Philadelphia—Plate producers see no let up to demand in sight. Under new regulations mills will be called upon to open books 45 days ahead of the lead time of a product for an ensuing quarter, although according to some interpretations such opening may not necessarily apply to an entire quarter but may apply on a month to month basis.

Boston—Although plate fabricators are seeking to place second quarter volume producers are reluctant to take on much tonnage beyond established defense needs.

Pittsburgh—Many fourth quarter CMP tickets are finding no available mill capacity open to them.

Wire . . .

Wire Prices, Page 147

Boston—Demand for heading wire is well maintained with only slight reductions in first quarter allotments.

Pittsburgh — United States Steel subsidiaries announced a price rise of approximately ½ cent per pound on galvanized wire products.

San Francisco—Columbia Steel Co. advanced prices of galvanized wire products an average of approximately one eighth of a cent a pound. Not affected are wire rope, strand and fish trap nettings which have no sliding scale.

Tubular Goods . . .

Tubular Goods Prices, Page 149

Cleveland—Reflecting the Oct. 2 increase of 2 cents per pound in the price of zinc, producers of galvanized pipe have raised their prices an average of $1 to $4 per ton. Some makers had originally announced the increase early in October but later withdrew the new discounts when OPS insisted that a notification period of 20 days be given before adjustments be made. This period expired Nov. 1 for most producers.

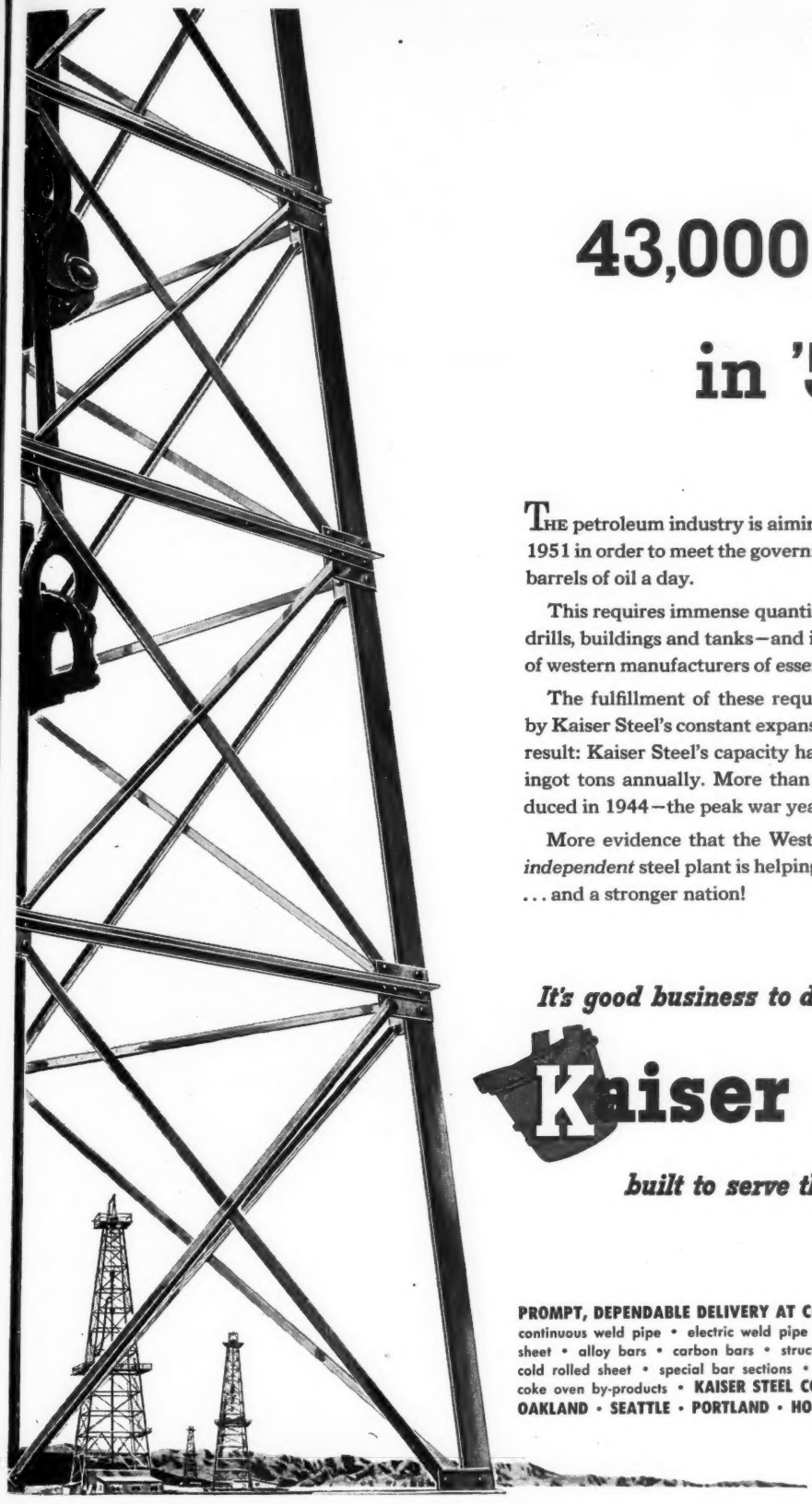
Pittsburgh—Due to the recent price increase on zinc, pipe producers have adjusted their discounts on galvanized material which now require consumers to pay $1 to $4 a ton more depending on the size ordered.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 145

Cleveland—Trade interest centers in an offer by a German steel importer to provide steel required for the proposed Ohio turnpike. Requests for 72,810 tons of steel for 1952 construction recently were turned down by the NPA. Consequently, the importer's offer is receiving consideration by the Turnpike Commission. The importer, Kurt Orban Co., says it is in position to provide all or a portion of the required tonnage depending on specifications. It can give delivery in two to three months, but prices quoted are above the domestic market.

Seattle—Reinforcing bar demand is insistent but rolling mills are accepting only small tonnages where such can be fitted into schedules. Producers' chief efforts are aimed at expediting deliveries.



43,000 more in '51!

THE petroleum industry is aiming at 43,000 new wells for 1951 in order to meet the government's goal of 7¼ million barrels of oil a day.

This requires immense quantities of steel—for derricks, drills, buildings and tanks—and is in addition to the needs of western manufacturers of essential civilian products.

The fulfillment of these requirements has been aided by Kaiser Steel's constant expansion of facilities. With this result: Kaiser Steel's capacity has now reached 1,380,000 ingot tons annually. More than *double* the amount produced in 1944—the peak war year!

More evidence that the West Coast's only integrated, *independent* steel plant is helping to build a stronger West . . . and a stronger nation!

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Kaiser Steel

built to serve the West

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates continuous weld pipe • electric weld pipe • hot rolled strip • hot rolled sheet • alloy bars • carbon bars • structural shapes • cold rolled strip cold rolled sheet • special bar sections • semi-finished steels • pig iron coke oven by-products • **KAISER STEEL CORPORATION** • **LOS ANGELES OAKLAND** • **SEATTLE** • **PORTLAND** • **HOUSTON** • **TULSA** • **NEW YORK**

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Oakite Compound No. 33 is a great soak cleaner for steel, cast iron, aluminum sheet and castings. It removes oil, rust, heat scale, other oxides, carbon smut, soldering and welding residues, identification inks and other soils. *It frequently eliminates pickling operations on moderately rusty steel.*

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Semifinished Steel . . .

Semifinished Prices, Page 145

Cleveland—Steel production is being pushed at capacity pace in this area. Barring labor difficulties and scrap shortage, expectations are output will be maintained at present peak levels indefinitely. Republic Steel Corp.'s plant here last month had record-breaking production. The 15 openhearths at the works turned out 163,207 tons during the month, bettering the plant's old record of 160,677 tons. Four large openhearths are under construction at this works and will be ready for operation in early spring, 1952.

Structural Shapes . . .

Structural Shape Prices, Page 145

Detroit—From a leading industrial contracting firm comes the report none of its jobs are being held up by shortage of structural steel. Well booked presently on several big defense projects the company nevertheless says it has not received any new business for several months and is worrying about business conditions for it by about mid-1952.

New York—Structural demand is spotty, being restricted by Washington limitations on construction. Bridge work appears the only type of construction to be coming out here with any degree of consistency.

Philadelphia—Structural demand continues to decline due to government restrictions. Some fabricating shops, which early in the year had well more than 12 or 15 months work on order, are now in position to accept tonnage for delivery within five to six months.

Pittsburgh—There has been no change in the structural supply situation in this district. Mills see little improvement in first quarter of 1952.

Seattle—Structural fabricators are highly selective in accepting new business because of the shortage of shapes. Backlogs extend to the end of first quarter.

Tool Steel . . .

Tool Steel Prices, Page 147

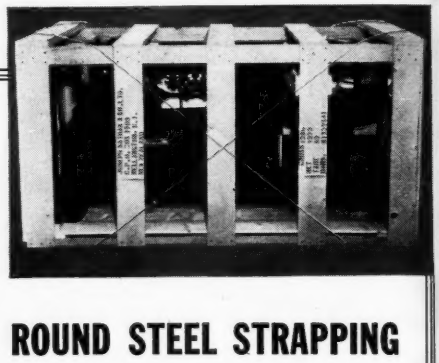
Washington — Recommendation is made to the National Production Authority to revise schedule B of ferroalloy order M-80 to permit use of carbon tool steel for all purposes since this material is in adequate supply. Also, it is suggested the tool steel industry be exempted from provisions of direction 7 to CMP regulation 1 which provides that users must charge against fourth quarter allotments third quarter tonnage unshipped by Oct. 7.

Pig Iron . . .

Pig Iron Prices, Page 144

Cleveland—Restoration of two idle blast furnaces to the active list in this district at the opening of the month has served to ease the pig iron supply shortage in this area. One stack of the American Steel & Wire Co., down since early September, resumed production of merchant iron, while an

This Diagonal Tie on crated machinery prevents torsional sway. It is galvanized to resist corrosion.



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● You won't have to worry about either the acceptability or the safety of defense orders tied with Gerrard Round Steel Strapping. It makes a tight, firm tie every time it is used.

You'll be pleased with the versatility of Gerrard Strapping, too. In addition to its suitability for securing boxes, cartons, and cases, Gerrard Round Strapping is the ideal choice for reinforcing all types of pallets, even such irregularly shaped objects as auto springs and axles. And with Gerrard Steel Strapping it is easy to fashion the Diagonal Tie for dependable reinforcement of all six sides of a carton or crate.

A Gerrard engineer will gladly consult with you about your defense strapping problems. Strapping ordered for defense receives preference in delivery according to current regulations. Strapping for non-defense purposes is being equitably distributed among our customers.

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UNITED STATES STEEL

idle stack of Republic Steel Corp., taken off Sept. 22, resumed on basic. It is estimated some 25,000 tons of iron were saved by speeding up the down time on the Republic No. 1 stack to 38 days from the normal 60 to 75.

Boston—Basic iron excepted, pig iron supply in this area is not critical. Relatively satisfactory supply of iron and cast scrap has permitted most shops to maintain quality in castings.

New York—Pressure for foundry iron is off due to a spotty situation among gray iron foundries on light work but there is still demand for all domestic tonnage offered. Demand for foreign foundry iron is off because of the premiums asked.

Philadelphia—Although makers of gray iron castings are not as badly in need of iron as they were, no domestic iron is going begging. Foreign iron, however, is a different matter, for consumers regard the premiums asked as being too stiff.

Chicago—Demand for pig iron comes closer to matching supply than at any time in recent months.

Pittsburgh—Gray iron foundry activity is lagging due to cutbacks in civilian durable goods industries.

Allegheny Ludlum Steel Corp. has made a long-term contract with Crucible Steel Co. of America for the purchase of pig iron from the latter's Midland, Pa. plant. The contract is for five years, and is expected to begin in 1953.

Scrap . . .

Scrap Prices, Page 152

Boston—Movement of cast grades has improved slightly. Steelmaking grades are also moving in heavier volume, but not enough to materially enlarge inventories.

Philadelphia—Government price regulations are having a stabilizing effect on supply of open hearth scrap. They are checking in considerable degree the flow of scrap to inland districts.

Pittsburgh — Scrap situation remains unchanged with consumers holding only a few days stocks instead of the 60-day supply which should be on hand as they go into the winter season. The trade is seeking to stop upgrading.

Detroit—Ceiling on dealer-to-dealer scrap transactions has been the subject of discussion in the trade and some interests believe it takes most of the incentive out of collection by peddlers.

Cincinnati — With allocations, enough scrap is coming into the district to support steel operations. Little tonnage is being stocked for winter, however.

Chicago—Heavy snows last week halted yard operations. Slowed shipments coupled with sharp increase of NPA allocations to Youngstown and Pittsburgh are expected to put Chicago steel plants on the ragged edge in a matter of days.

Seattle — Continuous struggle to get in enough scrap to keep the furnaces operating at capacity is reported. One buyer has contracted for 1000 tons from canneries and sawmills in Alaska. This scrap will be shipped by scow.

Iron Ore . . .

Iron Ore Prices, Page 151

Cleveland—Unseasonably low temperatures in the upper lakes region are hampering movement of iron ore and threaten an early closing of the shipping season. Shipments dropped to only 1,498,243 tons for the week ended Nov. 5 compared with 2,423,398 tons for the like week a year ago. This brought the cumulative total for the season to date to 83,270,213 tons against 71,761,248 tons for the like 1950 period.

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All Sizes
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60 seconds after application
SWIFT-FLOOR
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No production delays. Just prime, fill, tamp—over wood, concrete, steel for new floor or patch. Write for free book!
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PORT HOPE · ONTARIO, CANADA

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MEYCO CARBIDE TIPPED
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MEYCO saws and cutters in various diameters and thicknesses can be furnished to your individual specifications. MEYCO cutters have earned an enviable reputation where long tool life and precision are a must.
Increase production in your slotting, venting and slitting operations by using MEYCO cutters. Please furnish complete specifications and quantities desired when requesting prices and indicate material to be cut.
Manufacturers of precision tools since 1888
W. F. MEYERS CO., INC.
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Warehouse . . .

Warehouse Prices, Page 151

Pittsburgh—Warehouses are having no success in building inventories. During the last month their receipts have progressively worsened.

Cleveland—Whether the warehouses will have to absorb the recent increase of ⅛ cent in mill prices on galvanized sheets and other products is uncertain. Over recent months the distributors have had to absorb any added costs and they may have to do so in the case of galvanized items. A warehouse price order was reported being prepared by OPS months ago, but so far it has not been issued.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

660 tons, Depot Quartermaster, Marine Corps, Philadelphia, to Buffalo Steel Co., Tonawanda, N. Y.

525 tons, stringer bridges, state highway, Harvard-Lancaster, Mass., to Bethlehem Steel Co., through Bayer & Mingola Co., Worcester, general contractor.

493 tons, bridge work, Port Authority of New York, Newark, N. J., to Harris Structural Steel Co., New York.

430 tons, angles, Depot Quartermaster, Marine Corps, Philadelphia, to Bethlehem Steel Co.

400 tons, 648-foot Montana state bridge, Cascade county, to unstated fabricator; W. P. Roscoe Co., Billings, general contractor.

325 tons, state undercrossing, Vancouver, Wash., reported to Poole, McGonigle & Dick, Portland, Oreg.; C. J. Montag, Portland, general contractor.

300 tons, project at Hanford, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

STRUCTURAL STEEL PENDING

5400 tons, Palisades dam and powerhouse, Snake river, Idaho; bids to be invited in February by Bureau of Reclamation, Denver.

2200 tons, state bridge, Lancaster, Pa.; C. W. Good, that city, low on general contract.

1760 tons, Corps of Engineers, Baltimore; bids in.

875 tons, state bridge, Beaver county, Pennsylvania; Du Felice Construction Co., New Haven, Conn., low on general contract.

500 tons, industrial waterway bridge, Tacoma; general award to Anderson Bridge Co. and Roy T. Earley Co., joint low $1,342,265.

500 tons, transmission towers; Creamer & Dunlap, Tulsa, Okla., low $146,961 to Bonneville Power Administration, Denver.

497 tons, state bridge, Salem county, New Jersey; bids Nov. 27.

400 tons, state bridge, Lancaster county, Pennsylvania; Reiffton Construction Co., Reading, Pa., low on general contract.

220 tons, Washington state bridge, Grays Harbor county; bids to Olympia, Nov. 14.

200 tons, Long Island Railroad bridge, Glen Cove, L. I.; pending.

100 tons, Ross power house; bids to City of Seattle, Nov. 13.

REINFORCING BARS . . .

REINFORCING BARS PLACED

350 tons, Tacoma industrial viaduct, to J. D. English Steel Co., Tacoma, Wash.

300 tons, several Oregon state bridges to Portland suppliers; Tom Lillebo, Reedsport, Oreg., general contractor.

270 tons, factory, Hachmeister Inc., Allegheny county, Pennsylvania.

REINFORCING BARS PENDING

7250 tons, Palisades dam and powerhouse, Snake river; bids to be invited by Bureau of Reclamation, Denver, in February.

1500 tons, power plant, Dubuque, Iowa.

1200 tons, hot strip mill, Pittsburgh Steel Co., Allenport, Pa.

760 tons, by-product coke plant, United States Steel Co., Clairton, Pa.

500 tons, treatment plant and sewer system, Lake City district, Seattle; general bids in.

400 tons, International Graphite & Electrode Corp., Niagara Falls, N. Y.

325 tons, propeller test stand, Wright Field, Dayton, O.

225 tons, Bureau of Public Roads, Neville Island, Pa.

150 tons, Washington state highway project, Grays Harbor county; bids to Olympia, Nov. 14.

135 tons, Wayne Memorial school, Wayne, Mich.

122 tons, state bridge, Salem county, New Jersey.

PLATES . . .

PLATES PLACED

275 tons, hull plates, Navy Purchasing Office, Washington, to Republic Steel Corp., Cleveland.

100 tons, standpipe, Barrington, R. I., to Chicago Bridge & Iron Co., Chicago.

PLATES PENDING

3000 tons, liners and miscellaneous, Palisades dam and powerhouse, Snake river, Idaho; bids to be invited in February.

RAILS, CARS . . .

LOCOMOTIVES PLACED

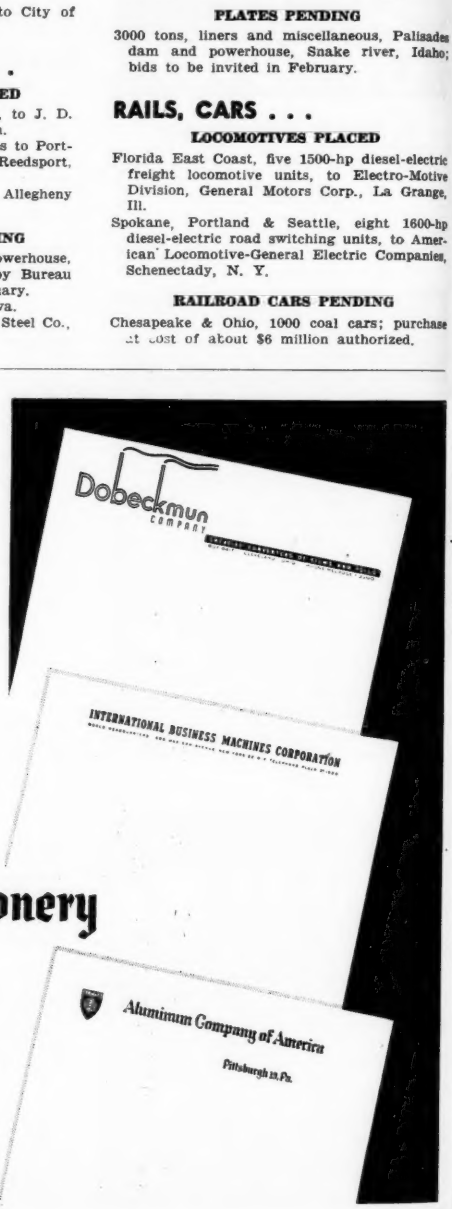
Florida East Coast, five 1500-hp diesel-electric freight locomotive units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Spokane, Portland & Seattle, eight 1600-hp diesel-electric road switching units, to American Locomotive-General Electric Companies, Schenectady, N. Y.

RAILROAD CARS PENDING

Chesapeake & Ohio, 1000 coal cars; purchase at cost of about $6 million authorized.

Actually, the letterhead is
where good grooming should begin
because it presents a
distinct opportunity to be an active
agent of good will
and not a dead overhead expense.



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Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Castings Producers Merge

Crucible Steel Casting Corp., Milwaukee, merged with Ebaloy Inc., Rockford, Ill., and will be known as Crucible Steel Casting Co. Division. Headquarters of the firm will be in Milwaukee. R. D. Colburn is president; A. J. Dempsey, vice president for operations; J. E. Schaible, vice president for sales. The company plans to expand aluminum casting operations at its Rockford plant to handle Air Force subcontract work. Crucible completed a $250,000 equipment expansion program in September which will add 20 per cent to its potential output. The equipment consists of 20 molding machines designed for production of small castings.

Talon Sells Erie Foundry

Erie, Pa., plant of Talon Inc. was purchased by Continental Foundry & Machine Co., E. Chicago, Ind. The Erie plant will be altered to handle Continental's Northern Equipment Division, now located at 1945 Grove Dr., Erie.

Buys Hydraulic Equipment

New York Air Brake Co., New York, purchased the stock of Hydraulic Equipment Co., Cleveland, manufacturer of oil-hydraulic pumps, valves and cylinders used principally on earth moving and materials handling equipment. Bernard Peyton, president, and Lewis K. Sillcox, executive vice president of New York Air Brake Co. are chairman and vice chairman, respectively, of the board of directors of Hydraulic Equipment Co.

Western Automatic Expands

Western Automatic Machine Screw Co., Elyria, O., is constructing a $2.5 million addition to its plant.

Frasse Opens Warehouse

Peter A. Frasse & Co. Inc., New York, opened its warehouse on Main avenue, Lyndhurst, N. J.

National Electric Expands

National Electric Products Corp., Pittsburgh, purchased a million-dollar factory in Elizabeth, N. J., from Standard Tool & Mfg. Co., Arlington, N. J. National is equipping the plant with more than $2 million worth of machinery for making electrical roughing-in materials. The plant will initially fabricate steel into rigid conduit, electrical metallic tubing, busway, switch boxes and electrical connectors. The company plans to make several new products in the new factory. National Electric is said to have completed arrangements to receive its requirements of pipe from National Tube Co.'s projected plant at Morrisville, Pa.

Brad Foote Buys Gear Maker

Brad Foote Gear Works Inc., Chicago, purchased Pittsburgh Gear Co., Pittsburgh, producer of gears for mining machinery and the steel industry.

Cincinnati Milling Moves

Cincinnati Milling & Grinding Machines Inc. and Cincinnati Milling Products Division, Cincinnati, moved their Detroit office to larger quarters at 24100 N. Woodward Ave., Pleasant Ridge, Mich. Joe P. Baldez is manager of the office. The Milling Products Division is headed by Carl Dannenfelser.

Gould Builds Ft. Erie Plant

Gould Storage Battery Co. Ltd., Canadian subsidiary of Gould-National Batteries Inc., is building a plant in Ft. Erie, Ont. The new plant, with equipment, will cost about $250,000 and is slated to go into production of batteries early in 1952.

Minnesota Mining Moves

Minnesota Mining & Mfg. Co. moved its branch sales office and warehouse to 330 Greene St., Buffalo.

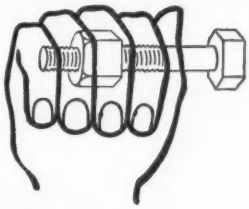
Gear Firm Adds Facilities

Foote Bros. Gear & Machine Corp., Chicago, leased about 24,000 square feet of space from Barrett-Craven Co. at 4613 S. Western Blvd., that city, for expansion of facilities used in the manufacture of high-precision aircraft gears and gear drives. The company is acquiring about 100 new high precision machine tools, including heat-treating furnaces, from the government and from prime contractors to the Air Force and Bureau of Aeronautics, under facilities contracts.

Oliver Buys Equipment Firm

Oliver Corp., Chicago, contracted to acquire either substantially all of the stock or the going business and properties of A. B. Farquhar Co., York, Pa., manufacturer of agricultural and industrial machinery. The Farquhar business will be operated as a separate division, retaining both its manufacturing and its dealer or-

IT GRIPS THE BOLT



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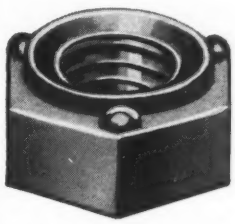
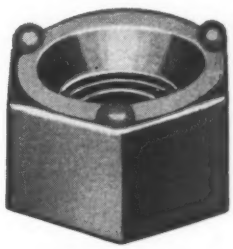
Gripco *Lock* Nuts are available in stainless steel or brass and for National Fine or National Coarse bolt threads.



Gripco *Pilot-Projection* Weld Nuts Speed production. Save time. The raised circular pilot fits snugly into the pilot hole, centering the nut instantly, accurately, ready for resistance welding. No measuring, no jigs, no special fixtures, no time wasted. Made with either of two pilot heights to fit different thicknesses of metal. Available with Standard or Gripco Lock Thread.



Gripco *Countersink* Weld Nut Hot metal particles dislodged by welding are shunted away from and do not stick to the Nut Threads.

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ganizations. E. H. Fisher will continue to be the general manager of its operations. William J. Fisher, president of Farquhar, will become a vice president and director of Oliver.

Motor Firm To Build in West

U. S. Electrical Motors Inc., Los Angeles, will construct a 250,000 square foot plant on the Santa Ana freeway, West Anaheim, Calif. Eventual employment will reach 4000 persons.

Honing Plant Opens on Coast

U. S. Honing Co. opened a plant at 1217 Newport Ave., Long Beach, Calif. The recently organized firm has facilities for honing the large hydraulic cylinders used in modern aircraft.

Gleason Plans Expansion

Plans for an $8,089,643 expansion program at Gleason Works, Rochester, N. Y., were revealed by E. Blakeney Gleason, president. Some of this money has been spent for machinery.

Morrison Buys Pump Line

Morrison Co., Milwaukee, purchased Heil Co.'s complete line of water pumps for rural household service. Production and distribution of the new line is under way.

Gulf Plans Cincinnati Plant

Gulf Oil Corp., Pittsburgh, will build a blending, drumming, and canning plant in Cincinnati for petroleum products. This plant is the latest project under Gulf's $200 million budget for expansion to be expended this year.

Lepel Moves to Woodside

Lepel High Frequency Laboratories moved into their new building at 55th street and 37th avenue, Woodside, Long Island, N. Y. The new plant will enable Lepel to triple production of high-frequency heating equipment.

Charlton Building Factory

Charlton Co. Inc., Fitchburg, Mass., is constructing a $350,000 building in the Los Angeles International Airport industrial tract for manufacture of convertible living room furniture.

Orders Nitriding Facilities

Chemical Plants Division, Blaw-Knox Co., Pittsburgh, received a contract from Otis Elevator Co., New York, for construction of nitriding facilities at the latter company's plant at Harrison, N. J. Otis is installing the new facilities in order to handle current contracts with the Air Force for the nitriding of aircraft cylinder barrels. The unit is expected to be in operation about Feb. 1, 1952.

Retooling To Cost Millions

Food Machinery & Chemical Corp., San Jose, Calif., received a $30 million V-loan to finance production of armored personnel carriers under Army Ordnance contract. Tooling cost for the project will approximate $42 million.

Lockheed Expands Further

Lockheed Aircraft Corp., Burbank, Calif., plans to expand its recently acquired subassembly facilities at Bakersfield, Calif., to more than double the size of the plant now being readied for operation. The original plant and the addition will provide 112,000 square feet of factory space.

GM Plans Winnipeg Depot

General Motors of Canada Ltd. will erect an assembly plant and parts depot in Winnipeg, Man. The city's finance committee approved sale of a 100-acre site for the development which may cost $2.5 million.

Bliss Names Representative

E. W. Bliss Co., Canton, O., appointed Iowa Machinery & Supply Co., Des Moines, Iowa, as sales representative and service agency for Bliss mechanical and hydraulic presses in central Iowa.

Cleco Appoints Distributor

Cleco Division, Reed Roller Bit Co., Houston, appointed Harris Pump & Supply Co., Brady and Sidney streets, Pittsburgh, as distributor in that area for Cleco air tools and accessories.

Reorganizes Aircraft Firm

Pacific Overseas Airlines, International Airport, Ontario, Calif., will be reorganized as Pacific Aircraft Industries Inc. The concern will be directed by Col. Paul R. Blair, United States Air Force, Ret., as executive vice president.

Victor Buys Canadian Plant

Victor Mfg. & Gasket Co., Chicago, purchased a plant in St. Thomas, Ont. The 60,000 square feet of floor space will be used for its Canadian manufacturing activities and distributing headquarters. The company plans to begin production there early in 1952.

Imports Milling Machines

Carl Hirschmann Co., Manhasset, N. Y., was appointed exclusive representative in this country for Technica A. G., Grenchen, Switzerland. A line of milling ma-

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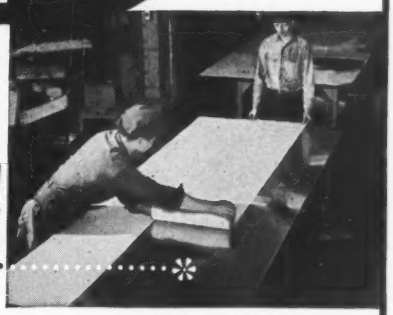

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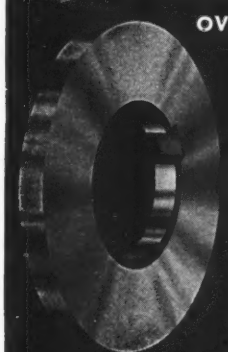

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chines and accessories manufactured by Technica for precision work on small parts will be imported by Hirschmann and stocked in Manhasset and Los Angeles.

Sherold Acquires Factory

Sherold Specialty Products Inc., New York, purchased a former foundry at Saratoga Springs, N. Y., and plans to open an electronics factory on the site. Work will begin at once to equip the building as a modern factory.

Rockwell Opens Tupelo Plant

Rockwell Mfg. Co.—power tools and industrial equipment—Pittsburgh, dedicated a branch plant encompassing 160,000 square feet at Tupelo, Miss. The Rockwell plant is the first large machine tool operation of its kind in the state of Mississippi.

Stove Maker To Be Renamed

American Stove Co., St. Louis, will change its corporate title Dec. 31 to Magic Chef Inc., subject to approval of stockholders.

Hill-Chase Gets Agency

Rigidized Metals Corp., Buffalo, appointed Hill-Chase & Co. Inc., Philadelphia, and Hill-Chase Steel Co., Baltimore, as distributors in those districts of its high-strength light-weight metals.

Avco Buys Canadian Firm

Physical assets of Brand & Millen Ltd., Long Branch, Ont., were acquired by Crosley Division, Avco Mfg. Corp., Cincinnati. Avco will operate the Ontario company, engaged in radio and television manufacturing, under direction of a wholly-owned subsidiary, Crosley Radio & Television Ltd. to be organized in Canada.

Struebling To Move Offices

Struebling & Buchheit Inc., Buffalo, distributor of tools and abrasives, purchased a building at 1215 Military Rd., that city, and is moving its offices and warehouse facilities to the new site. Harold J. Struebling is president of the company.

Saw Mill Machine Firm Sold

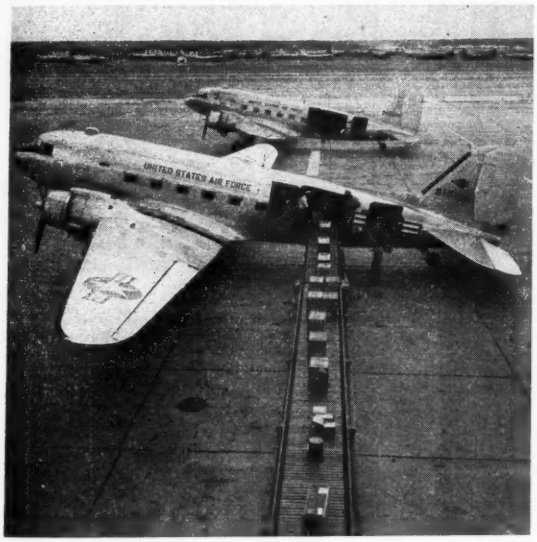
General Water Works Corp., Philadelphia, purchased American Saw Mill Machinery Co., Hackettstown, N. J., and will merge it with Sunset Engineering Co., Riverside, N. J., a subsidiary of General Water Works.

Warehouse Opens in South

Lyon, Conklin & Co. Inc., Baltimore, opened its new warehouse at 711 Edgewood St. N.E., Washington 17. This company is one of the oldest fabricators and distributors of sheet metal in the South.

Represents Warner Electric

Kenny Consolidated Engineering Industries Ltd., Toronto, Ont., was named representative for Warner Electric Brake & Clutch Co., Beloit, Wis., manufacturer of control equipment.



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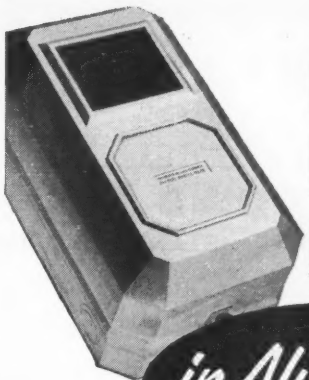

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27/32"	Rd. 10/12'	52100	700

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1-3/16"	Rd. 10/12'	52100	7000 #
3½"	Rd. 10/12'	52100	3400
3¼"	Rd. 10/12'	4320	1500
5"	Rd. 10/12'	4320	1100

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For Manufacturing Plant in Northern Ohio—Small City

Preferred: Man with engineering training, experience in installation, upkeep and preventive maintenance, electric ovens, heating units, furnaces, mechanical conveyors, hydraulic presses, grinding and other machinery; able to direct and handle men.

Send inquiries with complete history to Box 391, STEEL, Penton Bldg., Cleveland 13, O.

STEEL SALES REPRESENTATIVE
for large New York import firm

Successful record in the steel trade required. Capable of handling sales of substantial tonnage of imported steel to fabricators and warehouses. State qualifications, references, and territory desired.

Write Box 395
STEEL, Penton Bldg., Cleveland 13, O.

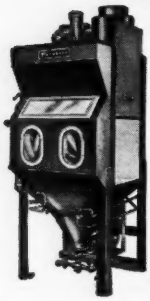
Representatives Wanted

WANTED
ESTABLISHED MANUFACTURER'S REPRESENTATIVE
—for Western New York State area. Contacts with fabricators of light gauge metal necessary. Excellent, fully protected line with a rapidly growing concern. Send full details to Box 390, STEEL, Penton Bldg., Cleveland 13, O.

Here's BIG NEWS on Blast Cleaning Dust Control Precision Finishing

Blast Cleaning Unit is PORTABLE!

Economically cleans large objects like tanks, structural work before painting. Six sizes, stationary or portable, from $170.00 and up.



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Liquid blast holds tolerances to .0001", reduces costly hand polishing, cleaning and finishing of molds, dies, tools, etc. Models from $1295.00 and up.

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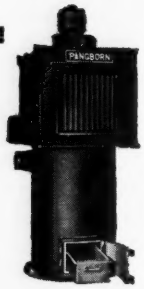
Pangborn industrial type Unit Dust Collectors trap dust at source. Solve many grinding and polishing nuisances and material losses. Models from $286.00 and up.



COMPACT Blast Cabinet for SMALL WORK!

Ideal for cleaning pieces up to 60" x 36". Cleans metal parts, removes rust, scale, grime, dirt, paint, etc., in a few seconds. Models from $315.00 and up.

WRITE TODAY for DETAILS about these precision Pangborn Machines. Address: PANGBORN CORPORATION, 1600 Pangborn Blvd., Hagerstown, Md.

Look to Pangborn for the Latest Developments in Blast Cleaning and Dust Control Equipment

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STILL THE ALL-AMERICAN FIRST

Master Gearmotors have given more millions of hours of satisfactory service in the field than all other makes . . . COMBINED.

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO

How roll necks on TIMKEN® bearings help a strip mill strip costs

THIS 4-high reversing cold strip mill is located at the Signode Steel Strapping Company in Baltimore, Md. It rolls strip at speeds up to 1200 feet per minute. Built by United Engineering & Foundry Company, the mill uses Timken® roller bearings on both the back up rolls and the work rolls. As a result, maintenance, lubrication and replacement costs are held to a minimum—trouble-free operation assured.

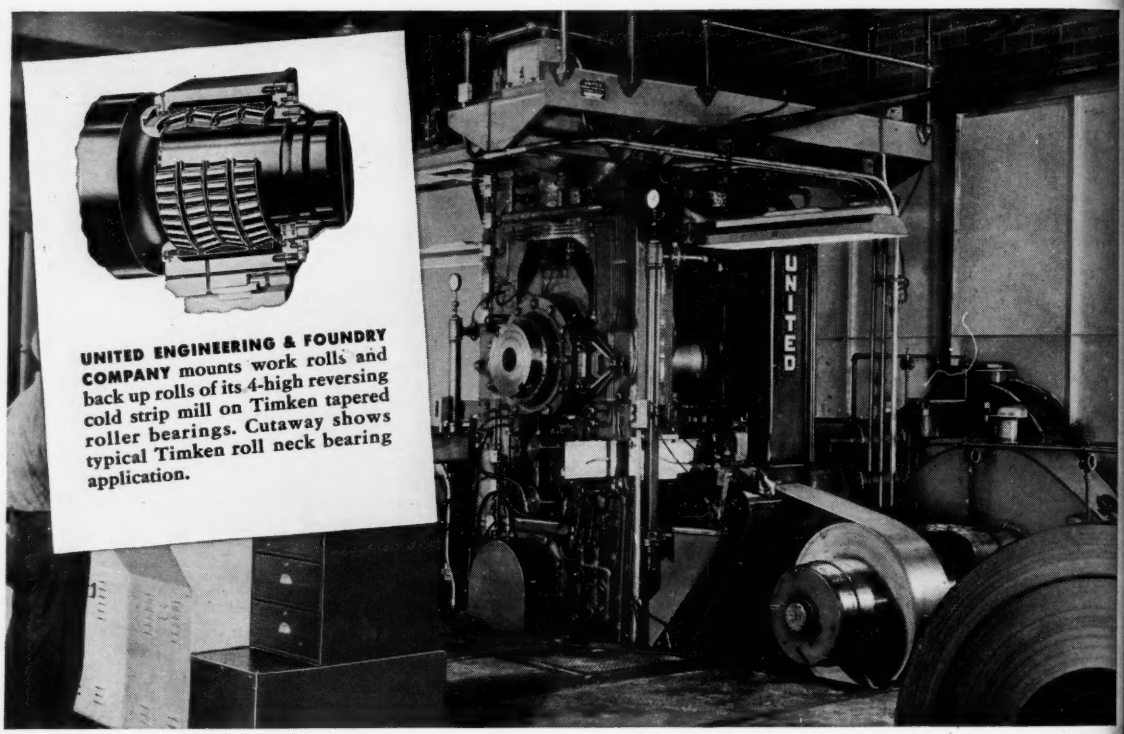
Because of balanced proportion design, Timken bearings give greater mill rigidity. Roll neck strength is increased 50 to 60%. Higher rolling speeds are possible because Timken bearings operate freely, frictionlessly.

Timken bearings permit the use of simple, economical grease lubrication. The need for costly and complicated systems is eliminated. Rolls can be changed faster, easier.

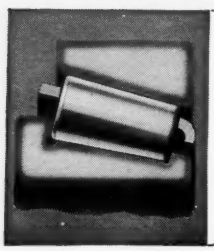
Supplementary thrust units aren't required because Timken tapered roller bearings take both radial and thrust loads in any combination. Rollers and races are case-hardened to give wear-resistant surfaces and tough, shock-resistant cores. And line contact between rollers and races means extra load carrying capacity.

You can be sure of all these advantages in either new or existing equipment by specifying Timken tapered roller bearings for work and back up rolls. Consult our roll neck bearing specialists for full details. Write The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



UNITED ENGINEERING & FOUNDRY COMPANY mounts work rolls and back up rolls of its 4-high reversing cold strip mill on Timken tapered roller bearings. Cutaway shows typical Timken roll neck bearing application.



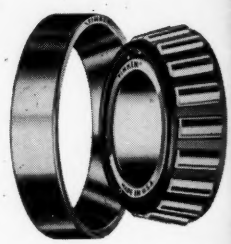
GREATER LOAD AREA

Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer. The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⓘ AND THRUST →ⓘ← LOADS OR ANY COMBINATION →◎←